

Hawaii Ocean Resources Management Plan

Hawaii Ocean and Marine Resources Council
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and

1998 Review of the Hawaii Ocean Resources Management Plan

Report to the Twentieth Legislature
Regular Session of 1999



CZM HAWAII
COASTAL ZONE MANAGEMENT PROGRAM



OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC
DEVELOPMENT AND TOURISM

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EXECUTIVE SUMMARY

The Hawaii Ocean Resources Management Plan sets forth guiding principles and overall recommendations for the State to achieve comprehensive and integrated ocean and coastal resources management. The Plan was mandated by Chapter 228, Hawaii Revised Statutes, and developed by the Hawaii Ocean and Marine Resources Council.

In mid-1990, a planning team was organized to identify critical issues, prepare technical papers and suggest policies and implementing actions. The planning team conducted fourteen public meetings statewide to solicit community input on ocean and coastal issues and ran technical workshops with experts in each of ten resource sectors. Existing State ocean and coastal programs, activities, personnel and funding resources together with related laws, rules, and regulations were surveyed. The information gathered through this process was the basis for preparing the Plan.

Sector papers focusing on ocean research and education, fisheries, harbors, ocean recreation, marine ecosystem protection, beaches and coastal erosion, waste management, aquaculture, ocean energy, and marine minerals were prepared. Summaries of these papers, together with sector-specific policies and implementing actions, are included in the Plan. Complete sector papers and the results of the State ocean programs survey are published separately in a Technical Supplement.

The extensive input provided by the public in preparation of the Plan revealed several critical concerns about the existing sector-specific management of Hawaii's ocean and coasts by State and County agencies:

- The current system of managing ocean and coastal resources is diffused among State and County planning, management and regulatory activities, poorly coordinated and inadequate.
 - Existing mechanisms and procedures for resolving ocean and coastal user and regulatory conflicts are inadequate.
 - Existing enforcement systems for ocean use laws and regulations are inadequate.
 - Public participation in and awareness of ocean and coastal resources, as well as their management, are lacking.
 - Current ocean and coastal management programs are reactive and issue-driven rather than anticipatory.
- Although a sector-specific approach was deemed adequate for earlier planning efforts, its weaknesses have become apparent. Some of the problems outlined above occur because a more integrated and comprehensive management approach is required. Others are due to a need for increased funding, better information and a more proactive approach to resource management.
- Whatever the cause, the State needs an innovative and dynamic vision of ocean management. This vision should rest on two guiding principles: 1) the critical need for ocean and coastal conservation to guide the State's decisions and actions, and 2) the functional necessity for an integrated approach to ocean management.
- The Council has made stewardship a central theme of the Plan. Ocean stewardship recognizes that the present generation is entrusted with the care and management of the marine and coastal environment and resources on behalf of generations yet to come. Stewardship means recognizing that there is a continuum of intensities of use with some areas designated for preservation and others for different types and levels of conservation and sustainable development. In adopting this concept, Hawaii is focusing on an overall conservation ethic that encourages those types of ocean resource uses that are environmentally sound as well as economically beneficial.
- The State requires a comprehensive, integrated ocean policy and management framework, as opposed to sector-specific ocean management plans. In developing management guidelines for the ocean and coastal areas of Hawaii, it is important to

recognize the dynamic linkages among the open ocean, nearshore, coastal and terrestrial environments. Managing this naturally integrated ecosystem requires a strategy which also is integrated. Ensuring that one resource management plan is consistent with another is as essential as guaranteeing that one resource use is compatible with another. Coordination between Federal, State, County and private interests is necessary, as is more effective public participation.

The policy guidance prescribed by the Legislature in 1988 supports Hawaii's development and maintenance of a comprehensive, integrated management system that ensures the enhancement and sustainment of its ocean and coastal resources:

1. *Exercise an overall conservation ethic in the use of Hawaii's ocean resources;*
2. *Encourage ocean resources development which is environmentally sound and economically beneficial;*
3. *Provide for efficient and coordinated ocean resources and activities management;*
4. *Assert the interest of this State as a partner with federal agencies in the sound management of the ocean resources within the United States exclusive economic zone;*
5. *Promote research, study, and understanding of ocean processes, marine life, and other ocean resources to acquire the scientific inventory information necessary to understand the impacts and relationship of ocean development activities to ocean and coastal resources; and*
6. *Encourage research and development of new, innovative marine technologies for exploration and utilization of ocean resources (§228-1, HRS).*

The Plan closely adheres to these directives. The vision they represent could be more fully realized with the implementation of the following overall recommendations.

Integrated ocean and coastal resources management requires a new governance

structure to implement the guiding principles. The public expressed great dissatisfaction with the status quo and felt that something had to be done immediately to improve ocean resources management. The Council recommends that the Legislature establish an Office of Marine and Coastal Affairs in the Governor's Office similar to, but separate from, the existing Office of State Planning. The new Office would be the central authority to perform such functions as planning and policy development, inter-agency coordination, communication facilitation and conflict resolution.

A comprehensive management system needs to combine a coordinated governance structure with integrated sector, regional and statewide plans as well as implement improved planning approaches. Thus, in addition to proposing a new governance structure, the Council formulated management recommendations that are interrelated and cut across all ocean sectors. The following are priority recommendations that can provide a foundation for all future marine and coastal management activities in Hawaii.

- *Implement a Regional Planning Approach.* Planning and managing ocean and coastal resources and activities on a regional basis embodies the concept of integrated ocean and coastal resources management. Rather than addressing specific resource sectors individually, this approach recognizes the dynamic links among marine, coastal and terrestrial environments and promotes activities that reflect these linkages. A regional planning approach involves defining a specific area, developing a plan-

ning and management system that responds to the various social, cultural, economic, environmental and physical attributes unique to that area, while ensuring compatibility among existing resource plans. A regional planning approach would not preclude or supersede existing State and County planning and management processes, but rather would be an extended component of these existing efforts.

- *Improve the Information Base.* Expand and integrate existing marine and coastal resource and use data bases as part of all planning processes.
- *Establish Carrying Capacities.* Incorporate social and environmental carrying capacities into current planning methods. Collaborate with County planning departments, relevant State agencies, university and private planning organizations to develop a methodology for determining carrying capacity based on clear management objectives.
- *Develop Conflict Resolution Procedures.* Augment existing judicial and administrative procedures for resolving user and regulatory conflicts by developing and implementing (on a trial basis) alternative dispute resolution methods.
- *Enforce Ocean Use Laws and Regulations.* Strengthen the enforcement system for ocean and coastal management.
- *Improve Public Participation.* Increase public education, awareness and participation in ocean and coastal resources management.

- *Anticipate Critical Issues.* Institute an anticipatory program designed to identify emerging issues in ocean resources management. Such an effort should look for potential opportunities as well as potential problems, devising responses to each which allow both for short-term mitigation and long-term solution

In addition to the overall recommendations for a new governance structure and for a comprehensive management system, policies and implementing actions for each of the ten sectors are presented in the Plan. These policies and actions recommend changes in sector-specific program activities and regulations and development of new initiatives by the State. The Council has not attempted to set priorities among these recommendations, nor had sufficient time to determine if they are mutually exclusive or in conflict with one another. It would become the responsibility of the new Office of Marine and Coastal Affairs to evaluate and prioritize the recommendations in conjunction with the designated agencies.

Work plans to implement both the priority and the sector-specific recommendations will be required. The designated agencies are expected to take the initiative in making program adjustments, instituting new programs and drafting legislation in order to address the recommendations pertaining to each agency. These activities should be coordinated with affected Federal, State and County agencies. The Office of Marine and Coastal Affairs would coordinate these efforts and implement any recommendations unrelated to the activities of the other agencies.

HAWAII OCEAN AND MARINE RESOURCES COUNCIL

The Council is composed of eleven voting members, including 6 ex-officio members and 5 members appointed by the Governor to represent commercial, recreational, environmental and research interests. The Council members are:

Roger A. Ulveling, Chairperson
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Deputy Director,
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GOVERNMENT AGENCIES

Federal Liaisons

U. S. Army Corps of Engineers,
Pacific Ocean Division
U. S. Coast Guard, Fourteenth
District
U. S. Navy, Pacific Fleet
U. S. Department of
Commerce,
*National Marine Fisheries
Service*
U. S. Department of the
Interior,
*Environmental Services
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Geological Survey
Minerals Management
Service
Fish and Wildlife Service
National Park Service, Pacific
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Western Pacific Regional
Fishery Management Council

Cooperating State Agencies

Department of Agriculture
Department of Transportation,
Harbors Division
Department of Land and
Natural Resources
Department of Health
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Department of Budget and
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Department of Education
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Office of Hawaiian Affairs
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Cooperating County Agencies

City and County of Honolulu
*Department of General
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Department of Parks and
Recreation
Department of Public Works*
County of Maui
*Department of Human
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Department of Parks and
Recreation
Planning Department*
County of Kauai
*Department of Economic
Development
Department of Public Works
Planning Commission
Planning Department*
County of Hawaii
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Department of Research
and Development
Planning Department*

PRIVATE ORGANIZATIONS

Conservation Groups

Blue Ocean Preservation
Society
Greenpeace Hawaii
Kilauea Point Group
Life of the Land

Malama Na I'a
Nature Conservancy of Hawaii
Natural Resources Defense
Council
North Kohala Coast
Preservation Group
Pacific Whale Foundation
Sierra Club

Non-Profit Organizations

Ala Wai Boat Harbor
Committee
Atlapac Fishing Club
American Canoe Association
East-West Center
Hawaii Chamber of
Commerce
Hawaii Fishing Coalition
Hawaii Yacht Racing
Association
Hawaiian International Billfish
Association
Kawaihae Boaters Association
Maui Boardsailing Association
The Ocean Recreation Council
of Hawaii
Oceanic Institute
Public Access Shoreline
Hawaii
Royal Hawaii Ocean Racing
Club
Waikiki Improvement
Association

Businesses

AECOS, Inc.
Alcantara & Frame
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Amorient Aquafarm, Inc.
Captain Zodiac Raft
Expeditions
Leo A. Daley

Dashiell Planning Services
DHM, Inc.
Gaffney and Associates, Inc.
Hanohano Enterprises
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Construction Co.
Hawaiian Electric Company
Hawaiian Island Seafarms
Kahuku Prawn Co.
Kinnetic Laboratories
Ko Olina Resort
KRP Information Services
Lacayo Planning, Inc.
Lahaina Divers, Inc.
M & E Pacific, Inc.
Makai Ocean Engineering, Inc.
Matson Navigation Company
Maui Economic Opportunity,
Inc.
North Bay Boating Club
Ocean Innovators
Oceanit Labs, Inc.
Pacific Fisheries Consultants
Pacific Marine
Pacific Ocean Producers
Paradise Cruises, Ltd.
SeaCulture, Inc.
Sea Life Park

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INTRODUCTION

Hawaii is a place unique and so appealing that millions of people from all parts of the globe are drawn to its shores each year. It is a breathtakingly beautiful string of subtropical islands bathed by tradewinds in the center of the world's largest ocean, remote from continental influences. Its ancient people carried out discovery and migration on one of the greatest scales known in maritime history. Emerging from this ancient tradition of marine exploration, its culture and lifestyles are wedded to the ocean. Many of its plants and animals are known nowhere else.

Yet, Hawaii is much more than the land and nearshore waters of its populated islands. Hawaii's archipelago extends 1,523 miles within a zone of deep, pristine ocean harboring an abundance of natural resources. Its surrounding Exclusive Economic Zone (EEZ) encompasses 922,967 square miles (697,000 sq. nm). With the addition of the EEZ, Hawaii has become the second largest state in the United States. Hawaii's current challenge is to acknowledge and fully comprehend the enormity of its ocean and coastal resources, and to develop an effective management regime to care for them. The possibilities these resources represent for human benefit and enjoyment are extraordinary. So too is the responsibility for using them wisely and passing them on to future generations.

In 1988, the Hawaii State Legislature, through Act 235 (Chapter 228, Hawaii Revised Statutes), the Ocean Resources Management Act, created the Hawaii Ocean

Resources Management Program. The Legislature recognized that although many government agencies have responsibilities for different ocean and coastal resources and uses, Hawaii had not yet developed a coordinated and consistent ocean policy framework. In addition, changing legal boundaries of State and national waters provide Hawaii with the opportunity and responsibility to assert its interest as a partner with Federal agencies in managing ocean resources within 200 miles of the coast.

The purpose of this Program is to develop a comprehensive and integrated framework for managing the State's ocean and coastal uses and resources. To implement the Program, Act 235 established the Hawaii Ocean and Marine Resources Council and charged it with developing an Ocean Resources Management Plan by 1991. The boundaries addressed by the Plan are from the coastal zone out to the limit of the 200-mile EEZ.

The Ocean Resources Management Plan is intended as a statement of Hawaii's commitment to nurture its ocean and coastal resources and protect their quality and diversity. The Plan focuses on integrating the management of these resources and emphasizes the importance of the ocean and coastal interface. It acknowledges that activities occurring on land directly impact the health and vitality of the ocean environment. Finally, it is an acknowledgment of the increasing and changing uses of ocean and coastal resources, and a pledge to anticipate and properly respond to these changes.

PLANNING PROCESS AND PUBLIC INVOLVEMENT

The Plan is the result of seven months of intensive work. People representing many diverse and sometimes conflicting interests have participated in its framing, writing and review. The diversity of interests – and the intensity with which views are held – have sometimes made it difficult to establish a consensus and clearly articulate it. The resulting document is but the first step towards integrated ocean management. Yet, the Plan's recommendations should make it possible to achieve increased consensus about how Hawaii's ocean resources and activities can best be managed and to design more specific mechanisms to carry out that consensus.

A. PLANNING PROCESS

A planning team consisting of Council staff and consultants¹ was organized to identify critical issues, prepare technical papers, suggest policy options, and draft the Plan for consideration by the Council. Using previous policy documents, the planning team synthesized a master list of issues critical to ocean management. This list was circulated for public input at seven public meetings covering all of the Counties.

The planning team gathered extensive documentation and interviewed relevant government, industry, and research experts to prepare technical papers on ten planning sectors, e.g. fisheries, ocean recreation. Each sector paper described the existing resource or activity, reviewed related State, County, and Federal regulatory regimes, and identified current management issues. Commentary

summarized from the public meetings was included in relevant sector papers. Each technical paper concluded with an initial draft of policy options and actions responding to the issues identified.

In the process of gathering the data and background documentation for these technical papers, the planning team identified experts whose commentary would improve and enrich the technical explanations and policy suggestions. Ten facilitated meetings were held to collect feedback from these experts in small group discussions. The planning team subsequently revised policy recommendations and prepared summaries for each sector. The sector papers are published in a Technical Supplement.

From the public and expert commentaries, the planning team identified the major issues to be addressed in developing an overall approach to ocean management. A draft Ocean Resources Management Plan was developed which included a statement of the major challenges facing the State, a description of the guiding principles to be adopted, recommendation of governance options for a more integrated approach to ocean management, and the sector summaries. After review and revision by the Council, the draft plan was released for public input and comment.

To aid in gathering public opinion regarding the draft plan, another round of seven statewide public meetings was held. The comments elicited from these meetings were included in the final Plan prior to its submission to the 1991 State Legislature.

B. PUBLIC NOTICE AND INVOLVEMENT

The planning team made extensive efforts to collect and include public concerns in the draft plan². Invitations and information regarding the planning process were mailed to over 1,200 people listed in the 1988-89 *Marine Directory*. More than 300 mailings were sent to schools, clubs, and community groups garnered from State agency lists, suggestions by community leaders, and government contacts. And, more than 300 Federal liaison staff, County staff, Legislature members, and interested citizens received direct mailings. Over 900 people attended the public workshops and expert working groups. Media contacts included 150 press releases, paid radio and newspaper advertisements via Mid Week, the Hawaii Newspaper Agency, Neighbor Island papers, and 16 radio stations.

Twelve hundred copies of the draft plan were mailed out to individuals who participated in public meetings or technical workshops, relevant Federal, State and County agencies and were placed in all libraries statewide in order to provide the public with the opportunity to read and comment. Every effort was made to incorporate their suggestions into the final Plan, and to communicate to those who participated that their suggestions were appreciated and considered. Background to the planning process is provided in Appendix I.

¹ Consultants included the University of Hawaii's Department of Urban and Regional Planning and Social Science Research Institute, together with private sector experts.

² Public meetings were facilitated and coordinated by the State Judiciary's Center for Alternative Dispute Resolution and the University of Hawaii's Sea Grant Extension Service.

HAWAII'S OCEAN MANAGEMENT HISTORY

Hawaiian history is replete with references to the use and management of both the land and sea. The traditional *ahupua'a* system divided land and marine resources into discrete management areas, providing a rational method for managing Hawaii's natural resources that remains in limited use today. As the Territory of Hawaii developed into a major producer and exporter of sugar and pineapple, greater emphasis was placed on land resources. By 1961, increasing pressure from economic expansion and demographic growth on the limited land resources prompted the nation's newest state to adopt the most comprehensive land use law in the country.

The pressure of growth has not abated. Rising resident and visitor populations, increasing affluence, and changes in consumption patterns have intensified the demands on Hawaii's resources. New kinds of recreational water sports, food and energy production and waterborne transportation are being conducted with increasing intensity in areas previously occupied by more traditional uses, such as swimming, surfing and fishing. In addition, rapidly developing marine technologies look promising for tapping new resources and using traditional ones more efficiently. These new and expanded opportunities and higher levels of use have led to increased competition and conflicts.

Some of the current ocean conflicts are long-standing disputes among sometimes incompatible user groups. For example, conflicts wax and wane between ocean-going canoes and swimmers at certain beach parks, and between surfers and boaters at other sites. More recently, jetskis have come to be regarded as a major safety threat to boaters and swimmers. Controversies over the use of public resources for private purposes or economic gain have also emerged. In addition, some commercial activities can adversely impact upon natural resources. Whale watching has grown into a substantial commercial enterprise, but also has led to public outcry

and increased efforts by both the State and Federal governments to regulate proximity to the whales by boat viewers. While these conflicts occur in the water, land-based activities also can affect ocean and coastal resources. Runoff from urban and agricultural areas, waste disposal practices (including throw-away plastics) and shoreline structures can damage natural resources and limit recreational opportunities.

A. OCEAN MANAGEMENT INITIATIVES — 1969 to 1985

State initiatives in managing ocean resources began in 1969 when the Governor's Task Force on Oceanography undertook a comprehensive examination of Hawaii's marine affairs and published *Hawaii and the Sea — A Plan for State Action*. In response to one of the 22 major recommendations highlighted in the report, a Marine Affairs Coordinator's Office was created in the Governor's Office in 1970. In 1973, the Governor's Advisory Committee on Science and Technology undertook another comprehensive review of the technical, economic and political environment for marine affairs in the State. *Hawaii and the Sea - 1974* was published the following year. In 1977, Hawaii's Coastal Zone Management (CZM) Program was created and subsequently approved by the U.S. Department of Commerce in 1978. CZM sought to fulfill its ocean management role by initiating a comprehensive ocean management planning process during the early 1980's. The *State of Hawaii Ocean Management Plan* was prepared and distributed in 1985, but was difficult to implement, and therefore never fully adopted or funded.

Since publishing the first *Hawaii and the Sea* report, the State has progressed significantly in the development, use and management of its ocean resources. A number of important marine-related programs and plans have been developed to address issues of ocean thermal energy conversion, fisheries,

aquaculture, ocean mining, ocean recreation and ocean research and development. In most cases, however, attention is directed to specific resources or activities, whereas responsibility for their management is frequently scattered among agencies without adequate coordination.

Hawaii has addressed most of its ocean issues on an *ad hoc* and episodic basis over the past two decades. However, answers to the more fundamental issues of State ocean management have proven more challenging: How can economic activities best be balanced with resource protection? How should use conflicts be managed? Where and when should commercial uses of public resources be permitted? Effective management to resolve these questions must consider the growing diversity of public and private ocean interests as well as the evolving role of government in ocean resources development.

B. CONTINUING NEED FOR OCEAN MANAGEMENT

In the past, the sector-specific approach to ocean management was adequate. Marine and coastal activities were more limited and ocean activities were not among the State's economic and political priorities. However, Hawaii's marine industries have recently emerged as important components of the State's economy. Expanded resource opportunities and responsibilities have also resulted from changed legal boundaries of State and national waters. Combined, these new developments have raised ocean and coastal issues to a higher position on the public agenda.

Change in Economic Structure

Historically, Hawaii's economy has been dominated by agriculture (primarily sugar and pineapple), tourism and federal expenditures. However, plantation agriculture, which accounted for 11 percent of gross state product in 1967, now amounts to about three percent, and federal expenditures (both military and

civilian) also have declined, from 28 percent in 1967 to about 25 percent. Tourism dominates Hawaii's economy. In 1989, the most recent year for which data are available, Hawaii hosted 6.6 million visitors who spent \$10.2 billion, accounting for almost 40 percent of gross state product that year (DBED, 1990).

Because tourism is vulnerable to international economic forces and shifting tastes, economic diversification is a constant theme and one of the major forces motivating Hawaii's interest in the ocean. Hawaii's ocean industries — aquaculture, fisheries, seafood marketing, ocean research and development, recreation and the maritime industry — generated \$893 million in revenues and accounted for 10,000 jobs in 1986 (MacDonald and Deese, 1989). Although this represents about only five percent of gross state product, taken together, ocean industries have surpassed all agriculture production and manufacturing in terms of economic importance to the State. In addition, they grew at an average annual rate of 11 percent from 1981 to 1986, compared to a growth rate of 6.6 percent for gross state product. Revenues for 1990 are projected to be \$1.4 billion (ibid).

Change in Legal Regime

In addition to the economic growth of ocean industries, the 1980s have seen significant changes in ocean jurisdiction and governance. The band of ocean lying seaward of the shoreline out to three nautical miles comprises the "old" territorial sea. Within these waters, the State retains direct management control over resources and activities. A Presidential Proclamation dated December 27, 1988, extended the U.S. territorial sea from 3 to 12 miles offshore. The Proclamation specified that extension of the territorial sea did not extend jurisdiction of any existing Federal or State law or the rights, legal interests and obligations therefrom derived. Nonetheless, the authority of

the President to override existing Federal laws which define jurisdictional boundaries using the term "territorial sea" has been questioned. Thus, the nature of State and Federal jurisdiction within the 3- to 12-mile band is still being debated at the national level.

The Presidential Proclamation establishing the nation's 200-mile Exclusive Economic Zone (EEZ) in 1983 changed the management and use of resources within this area from an international to a domestic issue. The conservation, exploration and development of EEZ resources are now the shared concern of the Federal and State governments. As a result, Hawaii has a range of interests regarding activities in this zone. In November 1988, Hawaii's voters overwhelmingly approved an amendment to the State Constitution that clearly asserts Hawaii's rights and interests in the EEZ. This clear articulation of Hawaii's ocean management authority and responsibility in the State's Constitution requires incorporation of the EEZ into the State's ocean regime.

The Territorial Sea and the EEZ Proclamations have significant consequences for domestic ocean and coastal resources management. In addition, the rapidly expanding array of ocean resource use opportunities, and their accompanying and often conflicting demands, increase the need for a seaward dimension to existing land-based planning activities. Appendix II diagrams the major ocean and coastal responsibilities in Hawaii. Continuous and improved coordination of government and private roles and responsibilities is essential, as is a broad, comprehensive effort to identify problems and to prioritize ocean management needs.

Thirty years ago, the State fashioned and adopted the most complete land use management system in the nation. Preparing an effective and broadly supported ocean resources management program is as necessary and timely now as was the preparation

of that land use management program three decades ago. Today, Hawaii's challenge is to comprehensively and successfully manage our ocean.

C. ENACTMENT OF THE OCEAN RESOURCES MANAGEMENT PROGRAM

Increasing demands and conflicts have raised the awareness of Hawaii's citizens and government about the need for effective ocean resources management. At the same time, new opportunities for economic growth and diversification, as well as increasing management responsibilities, are occurring. The policies of the Hawaii State Plan (Chapter 226, Hawaii Revised Statutes) underlie the State's approach to management and development of its ocean resources.

In creating the Ocean Resources Management Act and establishing the Hawaii Ocean and Marine Resources Council, the 1988 Legislature provided the opportunity and leverage for policy setting and inter-agency and inter-governmental coordination to a degree that had not previously been possible. However, the Council and this planning process have also had to address complex issues of resources management, user conflicts and jurisdictional gaps and overlaps to a far greater extent than previously required of any single agency.

With the 1985 *State of Hawaii Ocean Management Plan* as its starting point, the Council has developed an Ocean Resources Management Plan in which the guiding principles of ocean and coastal conservation and integrated ocean management recommend an improved governance structure and planning approach. The Plan has been devised specifically to address five critical ocean and coastal resource problems, and to better anticipate and ameliorate potential problems. These five problems are outlined in the next section.

MAJOR OCEAN AND COASTAL RESOURCE PROBLEMS

Over the years, Hawaii has developed a complex ocean and coastal management system. State and County agencies construct facilities such as boat launch ramps, provide incentives to emerging ocean industries such as aquaculture, and regulate fishing and other resource use activities. Agency personnel engage in a wide variety of planning, management and marketing activities. For example, they organize workshops on coastal tourism, produce promotional brochures on Hawaii's seafood, develop fish attraction devices and survey seabirds. The range of management activities is enormous, the number of people participating in ocean activities is considerable, and the management costs are substantial. As ocean industries grow in economic importance, the stakes are becoming higher.

In the past, most of Hawaii's ocean management efforts have focused on specific ocean sectors, resources and activities such as fisheries, recreation and energy. This approach mirrors the way most people think about ocean resources and activities. Yet, the extensive input provided by the public in preparation of this Plan revealed several critical concerns about the existing sector-specific management of Hawaii's ocean and coasts by State and County agencies:

- The current system of managing ocean and coastal resources is diffused among State and County planning, management and regulatory activities, poorly coordinated and inadequate.
- Existing mechanisms and procedures for resolving ocean and coastal user and regulatory conflicts are inadequate.
- Existing enforcement systems for ocean use laws and regulations are inadequate.
- Public participation in and awareness of ocean and coastal resources, as well as their management, are lacking.
- Current ocean and coastal management programs are reactive and issue-driven rather than anticipatory.

Although a sector-specific approach was deemed adequate for earlier planning efforts, its weaknesses have become apparent. Some of the problems outlined above occur because a more integrated and comprehensive management approach is required. Others are due to a need for increased funding, better information and a more proactive approach to resource management.

OCEAN AND COASTAL RESOURCES: THE VISION FOR HAWAII

A. GUIDING PRINCIPLES

In ancient Hawaii, the ocean claimed a role in every aspect of life. It provided food, routes for communication and transport, and was an endless arena for play. Even then, Hawaiians recognized that different beaches and waters were suited to different purposes and used their knowledge and *kāpu* systems to influence what activities occurred where. The ocean also has always been a source of spiritual replenishment, solace and quiet contemplation. Today, new technologies make it possible to develop the ocean responsibly. Yet, we must be certain to protect

and conserve precious and irreplaceable resources as we seek to realize opportunities.

As more attention and activity are focused seaward, government must anticipate and manage change. Ocean management must take the long view. Ocean resources are a public trust and must be treated as such. Government must act as a knowledgeable steward that nurtures these resources and provides for their long-term sustainment. However, ocean management will require more than government commitment. Effective ocean management also requires com-

munity and private sector understanding, cooperation and support. Although based on the public purpose and sensitive to lifestyle preferences and values, ocean management demands that these groups work together to ensure wise and appropriate use of Hawaii's ocean and coastal resources.

The State of Hawaii needs a dynamic vision of ocean management. Technological innovations are accelerating social and environmental change. Strong State ocean management must not only respond rapidly to opportunities and problems in ocean and coastal zones, it must anticipate them. Plans

which compile goals into a static end-state may become obsolete in the face of change. Both a fundamental sense of responsibility and an appreciation of the ocean's inherent worth are required. Consequently, this vision of Hawaii's ocean management rests on two guiding principles: 1) the critical need for conservation to guide the State's decisions and actions, and 2) the functional necessity for an integrated approach.

Ocean and Coastal Conservation

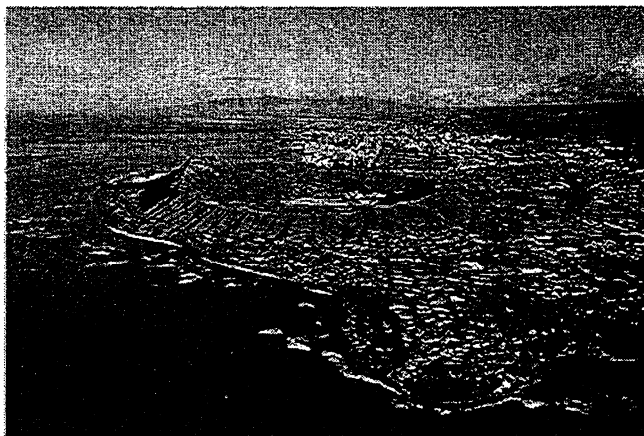
The Hawaii Ocean and Marine Resources Council has made stewardship a central theme of the Plan. Ocean stewardship recognizes that the present generation is entrusted with the care and management of the marine and coastal environment and resources on behalf of generations yet to come. Stewardship means recognizing that there is a continuum of intensities of use, with some areas designated for preservation and others for different types and levels of conservation and development. Stewardship must balance resource allocation for sustainable development with conservation through an anticipatory and proactive approach. In adopting this concept, Hawaii is focusing on an overall conservation ethic that encourages those types of ocean resource uses that are environmentally sound as well as economically beneficial.

Sustainable development builds on the concept of conservation. The International Union for the Conservation of Nature and Natural Resources (IUCN) defined conservation, in their authoritative 1980 *World Conservation Strategy*, as the management of the biosphere so as to yield the greatest benefit to present generations without reducing its potential to provide for the needs of future generations. Sustainable development means development done in a manner which maintains or prolongs the productive use of resources and the integrity of the resource base. Recognizing that economic development will occur in some areas where appropriate, Hawaii's stewardship approach identifies the need for social and environmental carrying capacities to define limitations and guide this development.

Conservation also means that in the wise use of ocean resources the essential integrity, diversity and productivity of marine and coastal communities and their habitats are maintained or, where necessary, restored. This also means identifying areas where unique or endangered species or resources occur and setting aside these areas as sites where special precautions must be taken. This commitment to long-term environmental quality will have immediate costs. Implementation of these management guidelines will require strong political will by government as well as better understanding and support by the general public and the private sector.

Integrated Ocean Management

In developing management guidelines for the ocean and coastal areas of Hawaii, it is important to recognize the dynamic linkages among the open ocean, nearshore, coastal and terrestrial environments. These environments are interconnected through ocean currents, wind and runoff, exchange of nutrients, and movement of flora and fauna. Managing this naturally integrated ecosystem requires a strategy which also is integrated. Ensuring that one resource management plan is consistent with another is as essential as guaranteeing that one resource use is compatible with another.



However, Hawaii's ocean management efforts to date have focused on specific ocean sectors, resources and activities. These efforts have been characterized by weaknesses associated with a sector-specific approach to ocean and coastal management — overlapping jurisdictions and authorities, conflicting uses and activities, and uncoordinated development and management efforts. The coordination between Federal, State, County, public, and private interests is necessary to achieve integrated ocean management. A critical link in this coordination is more effective public participation.

B. STATUTORY DIRECTION

The policy guidance prescribed by the Legislature in 1988 supports Hawaii's development and maintenance of a comprehensive,

integrated management system that ensures the enhancement and sustainment of its ocean and coastal resources:

1. *Exercise an overall conservation ethic in the use of Hawaii's ocean resources;*
2. *Encourage ocean resources development which is environmentally sound and economically beneficial;*
3. *Provide for efficient and coordinated ocean resources and activities management;*
4. *Assert the interest of this State as a partner with federal agencies in the sound management of the ocean resources within the United States exclusive economic zone;*
5. *Promote research, study, and understanding of ocean processes, marine life,*

and other ocean resources to acquire the scientific inventory information necessary to understand the impacts and relationship of ocean development activities to ocean and coastal resources; and

6. *Encourage research and development of new, innovative marine technologies for exploration and utilization of ocean resources [§228-1, HRS].*

The Plan closely adheres to these directives. The vision they represent could be more fully realized with the implementation of the following overall recommendations.

OVERALL RECOMMENDATIONS

The 1988 Legislature took a visionary step toward ensuring the long-term conservation of Hawaii's ocean and coastal resources by establishing the Council and tasking it with the development of an integrated ocean management plan. The Council is proposing a set of overall recommendations to address the problems identified earlier in this document (section IV). The Council considers these overall recommendations to be the steps necessary to achieve an integrated ocean management structure. Such a structure must provide for the continual updating and amendment of the Plan to meet new needs.

The Plan provides the State with a blueprint for building this management structure and an approach for coordinating management tasks. While this blueprint suggests changes in laws, organizational arrangements, allocation of financial resources and administrative procedures, the proposed approach focuses on strategies for managing ocean and coastal areas and uses rather than specific resources. The recommendations, therefore, begin by supporting legislative establishment of a new organizational entity

to oversee marine and coastal affairs.

Creating this entity is the crucial first step to enhanced management of Hawaii's ocean resources. The principles of ocean and coastal conservation and integrated management will guide the work of State government in addressing ocean issues. Once created, this management agency will be responsible for drafting specific work plans to implement the priority recommendations outlined later in this section. These work plans will be closely coordinated with the activities of relevant Federal, State and County agencies.

A list of acronyms for government agencies is presented in Appendix III. A matrix of Hawaii's current ocean programs by agency and management activity is presented in Appendix IV.

A. NEW GOVERNANCE STRUCTURE

Several organizational options for improving State governance of ocean and coastal resources management were developed. The recommendation listed below is the one being proposed to the Governor

and the Legislature. All of the options were evaluated based on a set of four criteria: *policy integration, operational coordination, leadership, and feasibility* (see Appendix V).

The following recommendation places policy integration and coordination for ocean resources management in the Governor's Office. The strength of this option is that it gives more stature and visibility to ocean and coastal management and allows for more coordination, communication, policy integration and conflict resolution capability than is currently the case. Establishment would be less disruptive administratively, be accomplished in less time, and be less costly than the creation of a new department (which also was considered as noted below).

Recommendation

Office of Marine and Coastal Affairs.

Establish an Office of Marine and Coastal Affairs in the Governor's Office similar to, but separate from, the existing Office of State Planning (OSP). The Office would be the central authority to perform such functions as planning and policy development, inter-agency coordination, communications

facilitation and conflict resolution. Such an office would be responsible for developing and implementing an annual ocean and coastal agenda. The Office also would be responsible for coordinating ocean and coastal education activities and coordinating EEZ issues with the line and staff agencies. This proposal would transfer all ocean and coastal programs from OSP to the new Office of Marine and Coastal Affairs. All other ocean-related line and staff functions such as resource development, enforcement, harbors management, etc. would remain distributed among the existing departments. This would keep functions in the agencies with the appropriate special expertise and jurisdiction.

The Council also recommends that this new Office shall have an advisory board with strong public participation which includes County membership. In addition, the Council supports any mechanism that resolves jurisdictional conflicts between departments. In particular, the Council supports a re-evaluation of the transfer of boating enforcement functions to the Department of Public Safety in favor of keeping these enforcement activities with the Boating Branch and transferring the Branch intact with the Coastal Areas Program to DLNR.

Major Options Considered

The following three options also were evaluated, but are not proposed at this time.

Deputy Director of Marine Affairs - Office of State Planning. This option would have established a Deputy Director's position for marine affairs in OSP in the Governor's Office. The primary functions performed by this Deputy Director would have been planning, coordination and conflict resolution. Placement in OSP would not provide the desired prominence and focus on oceans that is needed.

Deputy Director of Marine Affairs - Department of Land and Natural Resources. This option would have established a Deputy Director's position for ocean and coastal management in the Department of Land and Natural Resources. The public did not support this option. Adding oceans to this large land-based agency did not receive support from agencies or the Council either. Management of the oceans would not gain in focus or stature with this option.

Department of Marine and Coastal Affairs. The department would have consolidated the following management functions:

- Policy and planning
- Habitat conservation
- Ocean resources development
- Enforcement and public education
- Aquatic resources management
- Boating and water safety

These functions would have incorporated, but would not have been limited to, existing programs in various departments, e.g. aquaculture and fisheries, coastal zone management, etc.

The public expressed great dissatisfaction with the status quo and generally felt that something had to be done immediately to improve ocean resources management. The Council gave serious consideration to the public's support for a new Department of Marine and Coastal Affairs. The Council recognizes that a change from the status quo is appropriate, but felt that the priority need was for effective change that could be accomplished in the near-term. A new Department might not subsume all functions or resolve all jurisdictional problems. The Council has taken the public's concern into account in recommending an Office of Marine and Coastal Affairs to increase governmental responsiveness to ocean and coastal issues.

B. PRIORITY OCEAN MANAGEMENT RECOMMENDATIONS

A comprehensive management system needs to include a coordinated governance structure, integrated sector, regional and statewide plans and the implementation of improved planning approaches. Thus, in addition to proposing a new governance structure, the Council developed priority management recommendations that cut across all ocean sectors. Existing State and County plans should be coordinated with these recommendations and be reviewed to identify commonalities, gaps and inconsistencies and to determine ways in which they can be better integrated. Long-term planning exercises which take into account a range of possible future geologic, climatic, societal and technological changes also should be considered as a part of the plan integration process.

The following priority recommendations are interrelated and should form the basis for Hawaii's marine and coastal management activities:

- Implement a regional planning approach;
- Improve the information base;
- Establish carrying capacities;
- Develop conflict resolution procedures;
- Improve enforcement;
- Improve public participation programs; and,
- Anticipate critical issues.

With the guiding principles as a foundation, the new Office of Marine and Coastal Affairs would become the lead agency responsible for overseeing the implementation of the priority recommendations. Details of the recommendations are given below.

• **Implement a Regional Planning Approach.** Planning and managing ocean and coastal resources and activities on a regional basis embodies the concept of integrated ocean and coastal resources management. Rather than addressing specific resource sectors individually, this approach recognizes the dynamic links among marine, coastal and terrestrial environments and promotes activities that reflect these linkages. A regional planning approach involves defining a specific area, developing a planning and management system that responds to the various social, cultural, economic, environmental and physical attributes unique to that area, while ensuring compatibility among existing resource plans. In addition, issues and concerns outside the specified region must also be considered and included in any regional plan. Thus, a regional planning approach would not preclude or supersede existing State and County planning and management processes, but rather, would be an extended component of these existing efforts. This approach will provide for greater public participation in a given region although it would not take precedence over statewide interests nor should it be considered legally binding.

Pilot Projects. To test the validity of a regional planning approach, two or more areas (ideally including the Neighbor Islands) should be identified for "pilot" projects for the purpose of developing regional ocean

and coastal resources management plans. Following their designation, a regional task force should be created for each project area. Task force membership should include government agency, community and private industry representation. At the end of a 2 to 5-year trial period, the projects would be evaluated to determine whether this regional approach is to continue and expand statewide.

• **Improve the Information Base.** Expand and integrate existing marine and coastal resource and use data bases as a part of all planning processes. Activities could include:

- a) evaluating current State and County Geographic Information System (GIS) development;
- b) identifying and ranking sensitive areas for initial focus;
- c) developing and implementing a workplan for regional GIS development based on planning needs;
- d) adopting procedures for standardizing and continuously updating information that insures there is a thorough search for available information; and,
- e) making the information accessible to government staff, the public and private businesses.

• **Establish Carrying Capacities.** Incorporate social and environmental carrying capacities into current planning methods. Based on the data collected, such activities might include:

- a) collaborating with County planning departments, relevant State agencies, university and private planning organizations to develop a methodology for determining carrying capacity based on clear management objectives;
- b) assessing impacts of current activities and setting limits based on the agreed upon methodology;
- c) assessing development and/or activity impacts before they occur;
- d) applying chosen methodology to critical areas such as Hanalei Bay and Kaneohe Bay; and,
- e) evaluating the proposed methodology through a series of focused workshops and making appropriate revisions for in-

corporation into a regional planning system.

• **Develop Conflict Resolution Procedures.** Augment existing judicial and administrative procedures for resolving user and regulatory conflicts by developing and implementing (on a trial basis) alternative dispute resolution methods. Such methods could include:

- a) establishing facilitated "policy dialogues" on major coastal policy issues and developing general policies as well as priorities. The process should involve appropriate government agency, private sector, and community representatives; and,
- b) incorporating mediation as a site-specific or resource use-specific alternative for conflict resolution.

• **Enforce Ocean Use Laws and Regulations.** Strengthen the enforcement system for ocean and coastal management. Actions might include:

- a) providing sufficient resources for enforcement to increase the probability of compliance with laws and regulations;
- b) re-evaluating, consolidating and clarifying ocean use laws and regulations;
- c) developing programs to insure that the rationales for ocean use laws and regulations are widely disseminated and well-understood;
- d) increasing the penalties for violations and developing additional deterrents;
- e) expanding enforcement functions to include public education about existing regulations as an important component of enforcement;
- f) raising the level of professionalism among enforcement personnel by increasing educational, training and career track opportunities; and,
- g) educating the Judiciary on the importance of ocean use laws and regulations and the need for stiffer penalties.

• **Improve Public Participation.** Increase public education, awareness and participation in ocean and coastal resources management with activities such as:

a) forming regional task forces to provide an advisory role in the development of regional ocean and coastal plans;

b) identifying and evaluating existing and developing ocean and coastal resource education and public awareness programs on ocean resources management, uses and regulations;

c) establishing a network of public participation programs for coordination and implementation of public education programs; and,

d) establishing a community relations program to develop and implement public awareness and participation activities;

• **Anticipate Critical Issues.** Institute an anticipatory program designed to identify emerging issues in ocean resource management. Such an effort should look for both potential opportunities and potential problems, devising responses to each which allow both for short-term mitigation and long-term solution. Tasks for such a program could include:

- a) improving the monitoring of ocean resource-use permits to track fluctuations in activity sectors;
- b) establishing a scanning program to monitor relevant literature for emerging ocean-related social trends and technical innovations;
- c) publishing quarterly reports on the scanning and monitoring programs which include synthesizing the emerging issues identified into alternative scenarios for management consideration;
- d) organizing a staff working group to suggest potential responses to opportunities and problems depicted in the alternative ocean use scenarios described in the quarterly reports;
- e) assuring that agencies assess potential cumulative impacts of new activities and control their introduction to prevent over-commitment of resources;
- f) providing an institutional framework for policy development to address emerging management issues, such as an ocean policy center; and,
- g) assuring that local communities and businesses are involved in the identification of critical issues.

SECTOR-SPECIFIC RECOMMENDATIONS

In addition to the overall recommendations for a new governance structure and for a comprehensive management system, a series of policies and implementing actions for the ten resource sectors are included on the following pages. As noted previously, these policies and actions were assembled while developing each sector paper with input from workshops, public meetings and interviews with resource experts. Acronyms used in this section are explained in Appendix III.

Recommendations for changes in policies and regulations and for the development of new initiatives by the State are presented within the following sector-specific summaries. The Council has not attempted to set priorities among these recommendations, nor had sufficient time to determine if they are mutually exclusive or in conflict with one another. It would become the responsibility of the new Office of Marine and Coastal Affairs to evaluate and prioritize the recommendations in conjunction with the designated agencies.

Work plans to implement both the priority and the sector-specific recommendations will be required. The designated agencies are expected to take the initiative in making program adjustments, instituting new programs, and drafting legislation in order to address the recommendations pertaining to each agency. These activities should be coordinated with affected Federal, State and County agencies. The Office of Marine and Coastal Affairs would coordinate these efforts and implement any recommendations unrelated to the activities of the other agencies.

The following is a list of the sector-specific subject areas:

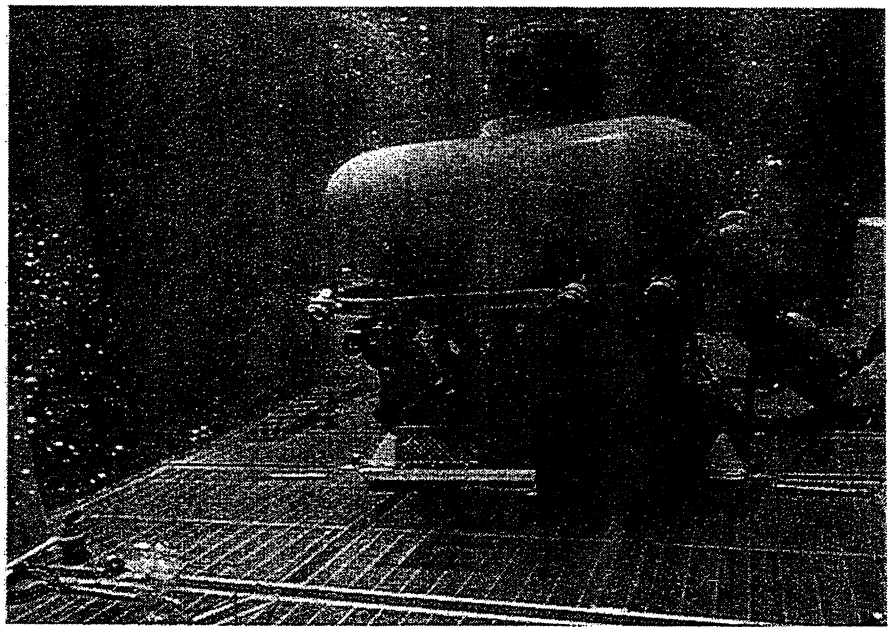
- **Research and Education**
- **Ocean Recreation**
- **Harbors**
- **Fisheries**
- **Marine Ecosystem Protection**
- **Beaches and Coastal Erosion**
- **Waste Management**
- **Aquaculture**
- **Energy**
- **Marine Minerals**

A. OCEAN RESEARCH AND EDUCATION

Ocean research and education will be major determinants of the long-term success of the Hawaii Ocean Resources Management Plan. The public has to understand the need for the Plan and why the policies and recommendations are proposed in order to give their support. A marine literate public is most likely to embrace the guiding principles of conservation and integrated management and collectively act as responsible stewards of Hawaii's ocean and coastal resources. Research is essential in order to establish the accurate information base needed to wisely manage these resources.

The Hawaiian Islands are an unequalled natural laboratory for ocean research and education. There is lack of neither potential research sites nor educational opportunities, and Hawaii enjoys one of the strongest institutional infrastructures in the country in support of these activities. Research and education take place in virtually every ocean-related field, including: aquaculture, biology, energy, engineering, fisheries, geophysics, law and policy, mining and minerals, oceanography, recreation, resource economics, surveying and mapping, transportation and water quality.

Research and educational use of Hawaii's ocean and coastal resources are managed by a wide variety of governmental agencies. Regulation and enforcement governing the collection of marine life and access to restricted areas are functions of the Department of Land and Natural Resources (DLNR), the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), the U.S. Navy (USN), and the U.S. Coast Guard (USCG). Water quality standards with which research and educational activities must comply, are established and enforced by the Department of Health (DOH). Curriculum development and general support for marine education are provided by the University of Hawaii (UH) and the Department of Education (DOE). General infrastructure support is provided by the Department of Transportation (DOT) and the High Technology Development Corporation. Marketing and promotional support for ocean research and development (R&D) are functions of the Department of Business, Economic Development and Tourism (DBED) and its attached agencies. Coordination



among the varied array of programs and facilities serving marine education would become the responsibility of the proposed Hawaii Ocean Center (HOC).

Management issues and needs associated with ocean research and education in Hawaii fall into eight major categories: 1) funding prioritization and resource allocation to support research; 2) market diversification to expand Hawaii's ocean R&D opportunities in the Pacific Basin; 3) conflicts with other kinds of activities such as fishing and recreation; 4) definition of marine education in regard to managing marine protected areas; 5) attitudinal behavior and how it affects responsible stewardship; 6) guidelines for the care and handling of marine animals and habitats; 7) water safety and liability relating to ocean-related student field trips and excursions; and 8) ocean and coastal interpretation to better educate the general public. These issues pertain to this sector paper. Additional issues related to research and education are presented in virtually all of the other sector papers where they can best be incorporated into resource- or activity-specific management strategies.

The following list of policies and actions do not imply any priority order. The first two policies relate primarily to research; the remainder relate primarily to education. Research and education, though often interrelated, are each associated with its own set of impacts and issues requiring essentially separate policies and actions.

Objective

Develop a supportive State management system that encourages and promotes marine education and that fosters the growth, continued economic viability and effectiveness of ocean research and development in Hawaii.

Policy A

Strengthen Hawaii's national and international competitiveness in attracting funds for ocean research and education.

Implementing Actions:

DBED should:

1. Continue to implement its marketing and promotional strategy to increase Federal spending for ocean research and development (R&D) in Hawaii.
2. Conduct a market analysis and develop and implement a marketing and promotional strategy to diversify and expand Hawaii's ocean R&D opportunities in Pacific Basin countries.
3. Extend the funding source listings in the Hawaii Trade Program to include regional consulting opportunities in marine education as well as ocean R&D.

Policy B

Mitigate user conflicts between research and non-compatible ocean use activities so that ocean research projects are not jeopardized.

Implementing Actions:

DLNR should:

1. Amend the ocean leasing law (Chapter 190D, HRS) to make it a more effective mechanism in support of ocean R&D.
2. Establish an artificial reef zone for research and other nonconsumptive uses at an appropriate site on a "pilot" basis. After a reasonable time period, assess the utilization and effectiveness of the zone to decide on the continuance of this site designation and possible extension of the zoning concept to other areas and research uses.

Policy C

Reduce user conflicts among marine-related groups and prevent overuse of the most preferred coastal field trip sites.

Implementing Actions:

DLNR, in consultation with DOE and affected marine resource centers and programs, should:

1. Designate and manage the most suitable coastal field trip sites as Marine Life Conservation Districts or as other kinds of management areas to enhance and provide for their greatest educational value.

DOE should:

2. Make greater programmatic use of Hawaii's marine resource centers as substitutes for field trip visitation whenever appropriate.

When established, the HOC should:

3. Coordinate regular scheduling for coastal field trips to reduce congestion and disperse use.
4. Seek additional access to new field trip sites from the proper military authorities.

Policy D

Ensure that proper stewardship attitudes are manifested among educators and other interpreters and students.

Implementing Actions:

UH and DOE together should:

1. Collaborate, draft and adopt a formal position statement that sets guidelines for the conduct of responsible research and education activities including that marine animals and their habitats are properly cared for and respected.

2. Directly involve and coordinate this effort with Hawaii's marine resource centers, schools and other appropriate government agencies and user groups.

3. Provide teacher training to develop marine literacy and to foster positive stewardship for the marine environment.

4. Coordinate partnerships with governmental, community and business agencies to provide supplemental instruction in stewardship.

DOE should:

5. Provide teacher resource positions in each school district to assist with teacher training and direct services to students (in class and in the field environment). [Currently, there is one resource teacher to help support marine and other aquatic education for grades K-12 statewide.]

Policy E

Prevent unintended activities from occurring in Hawaii's marine and coastal protected areas.

Implementing Actions:

DLNR should:

1. Clearly define "marine education" in whatever formal process is adopted to manage the resources under its jurisdiction so that the intent and meaning of the term is precise and unequivocal. [See Policy C, Action 1.]
2. Coordinate the formulation of this definition with the Counties and Federal government where overlapping jurisdictions and shared boundaries occur.
3. When formulating this definition, give credence to the ocean recreation/tour industry as an educational source which can supplement government resources.

Policy F

Ensure that Hawaii's school students are safe around the water and derive maximum benefit from ocean-related field trips and excursions.

Implementing Actions:

DOE should:

1. Require students to participate in a



water safety/learn-to-swim program. Seek mandatory funding to support this program.

2. Require administrators and teachers to participate in water safety workshops.

3. Complement coastal-site visits with carefully coordinated excursions to marine resource centers. [This has the added benefit of not contributing to overuse of field-trip sites (see Policy C, Action 2).] Additional staffing is needed to provide specialized instructions to students.

4. Coordinate/collaborate field trip objectives at the school level to avoid duplication in learning experiences.

5. Secure new funding for "in-the-environment" experiences which are more costly to provide than shore-based excursions.

Policy G

Increase public awareness of Hawaii's scenic natural and cultural/historic ocean and coastal resources through interpretive education.

Implementing Actions:

DLNR should:

1. Develop and implement statewide and regional ocean and coastal interpretive plans, including recommended sites, resource information, facilities, staffing, funding and programmatic needs.

2. Develop multilingual signs (especially Japanese) to help visitors and Hawaii's multi-ethnic population to better appreciate sites.

3. Work collaboratively and coordinate interpretive programs with the Counties and Federal government to encourage opportunities for joint agreements and shared resources and expertise.

B. OCEAN RECREATION

Hawaii's ocean and shoreline areas offer residents and visitors year-round opportunities to engage in a diverse array of recreational activities. Hawaii's coastal areas, beaches, shorelines and nearshore waters are considered vital to the State's ocean recreation and tourism industries. For Hawaii's residents, going to the shoreline is a favorite leisure activity. Hawaii has developed its diverse opportunities for ocean recreation into a major industry with annual revenues approaching \$500 million. Hence, ocean recreation activities are becoming increasingly important to Hawaii — both socially and economically. Innovations in designs and materials of recreational crafts and gear will provide additional opportunities for expanding the ocean recreation industry.

Hawaii's recreational resources are managed by a complex array of governmental agencies. Rules and regulations are carried out by the U.S. Coast Guard (USCG), the Department of Land and Natural Resources (DLNR), the Department of Transportation (DOT), the Department of Health (DOH), and County parks and police departments. The USCG and DOT's Harbors Division have joint management responsibilities for water-related activities, except recreational fishing which is managed by DLNR. Shoreline recreational activities are managed federally by the National Parks Service (NPS) and National Marine Fisheries Service (NMFS), as well as DLNR, and County parks departments.

Increased ocean and coastal recreational activities have resulted in a number of issues and concerns. More recreational opportunities, including parks, facilities and shoreline access, are required to accommodate Hawaii's growing tourism industry and resident population. In addition, water safety and training programs have not kept pace with the increasing variety of recreational uses and equipment. Conflicts between various user groups and between commercial and public recreationalists are also common. The commercial use of public beaches and open shoreline is occurring more frequently and has resulted, in some instances, in the displacement of residents. In addition, factual information on the level of use that recreational resources can sustain is lacking. Limits of acceptable change and/or limits to commercial use and activities at public beaches and shorelines need to be deter-



mined quantitatively and established. Finally, management and enforcement activities among the various government agencies are often ineffective and lack coordination.

Objective

Promote the development of safe ocean recreation opportunities which are socially and environmentally acceptable and compatible with other ocean and coastal resource uses and available to all residents.

Policy A

Maintain existing recreation facilities and provide needed additional recreation facilities especially in under-developed areas.

Implementing Actions:

DOT, DLNR, DBED and the Counties should:

1. Identify and prioritize ocean and coastal recreational facilities needing improvements through the State Comprehensive Ocean Recreation Plan (SCORP) and develop a plan to implement the necessary improvements which complements but is more detailed than the State Recreation Functional Plan.
2. Allocate additional funds needed to maintain current facilities properly.
3. Work with community groups to develop voluntary maintenance assistance programs to maintain recreational facilities.
 - a. Set up a community "Adopt-a-Park" program.

- b. Clarify possible liability concerns so volunteers can actively participate in maintenance programs.

- c. Develop a maintenance hotline for users to report needed repairs.

- d. Develop a community liaison program that provides volunteer maintenance groups access to needed funds or supplies to maintain facilities.

4. Identify and prioritize additional site-specific recreational facilities needed for coastal and ocean recreation activities and develop them.

5. Utilize a long-range planning strategy to:

- a. Determine which underdeveloped or undeveloped recreation areas should be set aside now to ensure their development as recreational sites in the future as opposed to being slated for possible resort development.

- b. Develop methods to set aside these areas such as land banking or private/public land exchange.

6. Encourage alternative development and funding options to develop needed recreational facilities.

- a. Develop provisions for government incentives to induce private-sector investment in infrastructure development of marinas; shore-based, small boat storage facilities; shoreline parks and park facilities.

- b. Require resort marina developers to develop public boat launch ramps, boat storage facilities, parking, etc., or to develop other provisions of significant public benefit.
 - c. Upgrade and maintain boat launch ramps then charge user fees for all users (commercial and non-commercial) using these facilities.
7. Establish a program to coordinate the acquisition and/or use of Federal lands, recreational facilities and waters for recreational resource development and support areas for coastal and ocean recreation activities.

DLNR and the Counties should:

- 8. Ensure coordination in implementing the recommendations developed in SCORP, the State Recreation Functional Plan and State or County parks development plans.

DOT should:

- 9. Immediately implement offshore mooring areas regulations and plans for establishment of offshore mooring and day-use mooring sites, as well as on-shore support facilities.

- a. Develop a one-step permit process at DOT to eliminate jurisdictional overlaps and a complex review of offshore mooring permits.
- b. Encourage commercial participation in the development of day-use moorings.

Policy B

Maintain and expand access to and along the shoreline where needed.

Implementing Actions:

DLNR and the Counties should:

- 1. Coordinate implementation of the Statewide Trail and Access System recommendations with implementation of recommendations developed in SCORP, the State Recreation Functional Plan, County parks development plans and shoreline access plans.
- 2. Ensure continued funding of the Statewide Trail and Access System.
- 3. Ensure that expanded access does not adversely impact other ocean and coastal resources since expanded access generally means increased use of an area.

- 4. Maintain current access and public rights-of-way to the shoreline by:
 - a. Opening public access routes currently blocked by adjacent property owners or clogged by weeds.
 - b. Clearly mark all shoreline access and public rights-of-way and install garbage receptacles.
 - c. Publish guides (brochures, maps) to shoreline access locations.
 - d. Develop strict guidelines for private shoreline developers to ensure adequate access by developing a formula that mandates a required number of parking spaces and ancillary recreational facilities adjacent to access nodes.
 - 5. Formulate a cooperative Federal, State and County strategy to expand public access through public and private lands to recreational areas, or expand the Statewide Trail and Access System to include Federal involvement.
 - 6. Develop legislation to resolve liability concerns regarding access to the shoreline on government lands.
- ### Policy C
- Reserve certain areas as traditional wilderness or low impact areas.
- ### Implementing Actions:
- DLNR should:*
- Identify and designate wilderness and protected areas where access should remain limited, and determine acceptable levels and means of access to wilderness areas. Acceptable levels of means of access should include determination of the amount, if any, of commercial activity that should be allowed and the types of recreational equipment that may be utilized, e.g., motorized vs. non-motorized equipment. [See Marine Ecosystem Protection section.]
- ### Policy D
- Develop and support a comprehensive and coordinated water safety program which clarifies liability concerns and includes training and education.
- ### Implementing Actions:
- DLNR and the Counties should:*
- 1. Encourage legislation to resolve the liability concerns of DLNR's State Parks Division and the Counties regarding

- County lifeguard services at State beach parks.
- 2. Seek to expand current enabling legislation that allows the State to contract with the Counties for lifeguard services to include not only State beach parks but all State beaches.
 - 3. Continue to identify and prioritize beaches where lifeguard services are most needed.
 - 4. Establish minimum lifeguard training standards and provide a central location for data on all water-related accidents.
- DOH, in cooperation with DOT, DLNR and the Counties should:*
- 5. Seek the necessary funding to expand the water safety intervention methods program in DOH to include all heavily impacted beaches statewide.
- DLNR, DOT, DOE, DBED and the Counties should:*
- 6. Develop informational and training programs for the general public to educate users on water safety and swimming skills, resource use restrictions, boating and water safety regulations, proper and safe use of equipment, cultural and traditional uses and conflict avoidance. Use existing Federal, State, County and private-sector programs to coordinate and enhance water safety training and education. [See Research and Education section.]
 - 7. Establish a task force of Federal, State and County agencies and the visitor and ocean recreation industries to develop a comprehensive, systematic approach to implementing a successful water safety information program.
 - a. Review current liability concerns expressed by the visitor industry regarding provision of safety information to visitors and the assumption of liability that incurs.
 - b. Enact legislation or other means necessary to resolve these liability concerns.
 - c. Develop brochures and other media techniques, in a variety of languages, to inform visitors of water safety hazards.
 - d. Develop a comprehensive signage program to post needed warning signs

in hazardous beach and shoreline locations statewide.

DOT, DLNR and the Counties should:

8. Work with community groups to develop a coordinated volunteer search and rescue program to supplement USCG and County fire department rescue efforts.

DOE should:

9. Resolve current liability concerns regarding the teaching of swimming and consider the need to develop mandatory swimming lessons in schools. [See Ocean Research and Education section.]

DLNR, DBED, DOT and the Counties should:

10. Promote development of statewide volunteer surf/lifesaving clubs patterned after Australian clubs to work with lifeguards and commercial operators who provide rescue services.

Policy E

Maintain the environmental and social quality of recreational resources by limiting use.

Implementing Actions:

OSP, DLNR, DOT and the Counties should:

1. Develop a comprehensive inventory of nearshore and coastal resources and activities. Use this inventory to determine site-specific allocations based on quantifiable data. Make the inventory available for use by all resource managers statewide.

2. Develop a comprehensive use-level management process that requires all commercial ocean recreation ventures to obtain permits prior to being allowed to operate and require agencies to control the issuance of commercial permits once limits of use have been determined.

3. Determine the appropriate methodology to identify social and environmental carrying capacities for heavily used areas and potentially impacted areas that ensures monitoring of the impacts and limits use as needed.

a. Ensure that the methodology established is used by all agencies tasked with managing the recreational resource so that data are consistent.

b. Consider the "Limits to Acceptable

Change Planning System" as one method of determining impacts and managing resources.

c. Organize a workshop of agency personnel to train all resource managers in the chosen methodology.

d. Assess impacts of current activities and set limits based on analysis of data and implementation of the methodology.

e. Ensure that the methodology can accurately determine current impacts and assess cumulative impacts as commercial activities grow.

f. Conduct an environmental assessment or a similar assessment on proposed new economic activities, in cooperation with the commercial enterprise.

4. Explore and develop options for limiting access to heavily impacted recreational sites, e.g., permits, entrance fees, etc. Develop several options for limiting access by commercial operators instead of just relying on a bidding process.

OSP, DBED, DLNR, DOT and the Counties should:

5. Work with the ocean recreation and visitor industries to develop a cooperative planning effort to disperse recreational use. Such an effort should:

a. Identify the needs of residents and visitors in determining dispersion patterns.

b. Identify and develop alternative sites that offer similar or comparable experiences to heavily used areas.

c. Analyze dispersion of use so that no single area is too heavily affected, unless it is designated for high use, e.g., Waikiki Beach.

d. Establish an effective marketing strategy to market alternative destinations to disperse use.

Policy F

Determine current and anticipated impacts of ocean recreation activities on residents and develop plans to assure that both land and sea activities are compatible with one another.

Implementing Actions:

OSP, DLNR and the Counties should:

1. Develop clearly defined policies for the commercial use of open shoreline and public beach parks in residential neighborhoods and beach parks or shoreline areas intensely used by residents.

OSP and DBED should:

2. Determine impacts from new hotel construction and develop plans to minimize these impacts.

3. Consider limiting the size of future hotel developments allowed outside specified resort nodes in order to alleviate additional impacts.

Policy G

Develop methodology to mitigate conflicts between various ocean recreational activities where the parties to the conflict can be identified.

Implementing Actions:

DOT should:

1. Hire or contract the services of mediation professionals to provide a process for conflict resolution or work with the Judiciary's Center for Alternative Dispute Resolution.

2. Develop a public information campaign on "rules of the road" and traditional uses for water-related activities to promote proper use of equipment and understanding of rights-of-way.

3. Work with the ocean recreation industry to inform visitors of use restrictions and traditional rights-of-way.

4. Encourage the ocean recreation industry to develop methods to address community concerns.

5. Identify additional areas where conflicts are occurring and develop restrictions to mitigate potentially hazardous conditions.

Policy H

Maintain resource quality and expand programs for enforcement of recreational resource use regulations.

Implementing Actions:

DOT, DLNR and DOH should:

1. Seek additional funding to increase enforcement capabilities of agencies involved in recreational resource management, including manpower, equipment, training and salaries.

2. Provide cross-training to ensure that each agency can enforce the other's regulations.
3. Clarify jurisdictional constraints to effective enforcement.
4. Develop a hotline for users to report violations of regulations and ensure timely response to complaints.
5. Analyze current hiring practices of enforcement personnel to ensure that DOT, DOH and DLNR officers are receiving similar training, pay and opportunities for advancement.
6. Educate users on resource restrictions.

DOT should:

7. Implement the Ocean Recreation Management Rules by installing buoys, posting signs and educating users about regulations.

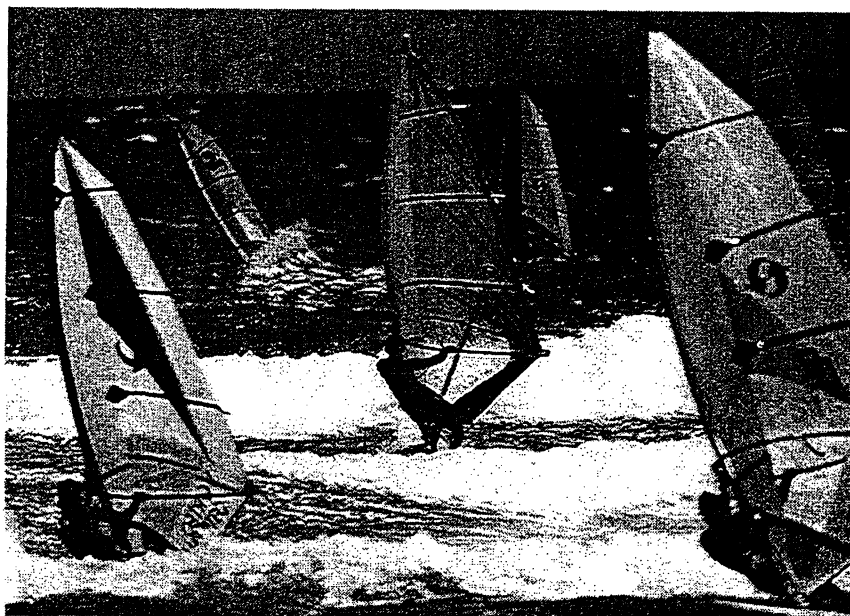
Policy I

Develop a coordinated strategy of resource management that eliminates current jurisdictional overlaps or gaps.

Implementing Actions:

DLNR and DOT should:

1. Support the transfer of the Boating Branch from DOT to DLNR.
2. Re-evaluate the transfer of boating enforcement functions to the Department of Public Safety in favor of keeping these enforcement activities with the Boating Branch and transferring the Branch intact to DLNR.



Policy J

Develop agency advocacy for the marketing and promotional support of desirable ocean recreation industry sectors.

Implementing Actions:

DBED should:

1. Clarify the state's goals regarding tourism promotion and the support for the ocean recreation industry that services the tourist.
2. Develop a central permit process and work with other agencies to coordinate and expedite the commercial permit process ensuring that resource impacts are considered.

3. Identify desirable ocean recreation industry sectors.

4. Promote ocean recreation and sports industries through industry development and marketing support with emphasis on providing infrastructure for existing business.

- a. Identify sources of funding and other legal requirements necessary to start a business.
- b. Determine infrastructure needs, identify available infrastructure and work with agencies to increase infrastructure to meet demands.

C. HARBORS

Commercial Harbors

Hawaii is totally dependent on its commercial harbor system for maintaining its economy and lifestyle. The State's heavy reliance on imported goods makes it imperative that our harbor system be maintained and improved. Nearly 98 percent of the goods imported into the State enter through the commercial harbor system and this statistic has not changed significantly over time. Hawaii is equally accessible to all major markets in the Pacific Rim and its harbors are the main distribution points for inter-island shipping and commodity export. In

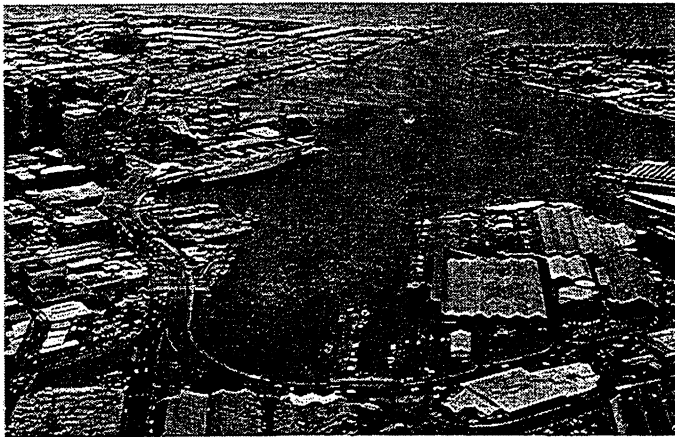
1988, 23.7 million tons of foreign, domestic and inter-island cargo were handled at Hawaii's ports. The rate of increase in imported cargo is estimated at two percent to three percent annually. Ocean transportation and ship repair posted 1986 revenues of \$400 million. Hawaii's commercial harbors also provide services to cruise ships, foreign-flag fishing vessels and local offshore fishing vessels. Hawaii has 11 commercial harbors operating throughout the islands as well as two offshore mooring sites for off-loading oil refinery petroleum products at Barbers Point.

The major issue facing the State is the long-term capacity of commercial harbor

facilities. Infrastructure at several harbors is inadequate to handle increasing cargo volumes. Existing facilities are inadequate for the growing cruise ship industry and local offshore long-line fishing fleets. In addition, basic dockside amenities are not available at Honolulu Harbor for the crews of foreign tuna long-line vessels re-provisioning in Hawaii.

Objective

Develop and maintain the State's commercial harbor system in order to meet both the needs of commercial users, and foreign and domestic commerce; and ensure that significant environmental and social impacts will be mitigated.



Policy A

Expand and improve the capacity of the State's commercial harbor system.

Implementing Actions:

DOT should:

1. Expedite the implementation of the 2010 Master Plan for each commercial harbor in cooperation with each harbor's advisory committee.
2. Incorporate mitigation plans for environmental and social impacts into the master plans for each commercial harbor.
3. Evaluate the effectiveness of the Statewide Transportation Planning Council in providing adequate inter-agency — in particular, effective County — participation and recommend any improvements.
4. Expand container facilities at Honolulu Harbor and other commercial harbors by rebuilding piers or building new piers, so they are able to accommodate modern cargo-handling facilities.
5. Encourage the private sector to develop basic dockside amenities for the crews of foreign tuna long-liners during re-provisioning stop-overs in Honolulu Harbor.
6. Work with the private sector and labor organizations to develop an expanded ship repair industry in Honolulu Harbor.

DOT, in cooperation with OSP, DBED, DB&F and the Counties, should:

7. Acquire areas needed for expansion and development of harbors, and designate other areas for future acquisition, particularly under-utilized areas.

Policy B

Minimize and mitigate impacts of harbor development and operations on ecological and cultural resources.

Implementing Actions:

DOT, DOH and DLNR, in cooperation with, UH, COE, and the Counties should:

1. Seek to instate comprehensive and on-going water quality and marine life monitoring programs for all existing and proposed commercial harbors in order to assess the environmental impact of harbor development and operations.

DOT, in cooperation with DOH, DLNR, NMFS, and COE, should:

2. Provide funding for research on the potential environmental impacts of commercial harbor development, including impacts on marine mammals and sea turtles, and the linkage between harbor construction and *ciguatera* poisoning in the area.

DOT should:

3. Improve dissemination of research and monitoring findings to the public so that community members can have a greater understanding and awareness of the impacts of commercial harbor development on the marine ecosystem.

Small Boat Harbors

There are 18 small boat harbors and 50 boat launching ramps throughout the State catering to both the recreational public and the commercial ocean recreation operators. Although most of the small boat harbors are State-owned and operated, Oahu has several small boat harbors operated by private groups or the military. In addition, private boat harbors are being proposed as part of resort developments on all islands. The unprecedented growth of the commercial ocean recreation sector has significantly increased the demand for developing additional small boat harbor facilities. In total, gross revenues generated by the different sub-sectors servicing the recreational boaters in 1989 are estimated at \$58 million.

The major management issue facing the

State is the significant lack of supply of small boat harbors, launching ramps and associated facilities. Existing small boat harbor slips accommodate only a very small percentage of boat owners wanting slips. Dry-stack storage facilities provide a useful alternative to permanent slips, but there is only one such facility in the State. Lacking are a coordinated planning framework for small boat harbor development and a clear, overall State policy on marina development. The high cost of building small boat harbors also contributes to the shortage. Such inadequacies are increasing competition and conflict between commercial and private recreational boaters. Finally, maintenance of small boat harbor facilities is inadequate and underfunded.

Although the planning and financing of construction differ for commercial harbors and small boat harbors, both are managed by the Department of Transportation (DOT).

Objective

Develop and maintain the State's small boat harbor system in order to meet the needs of recreational and small commercial vessel users in ways that ensure significant environmental and social impacts will be mitigated and local carrying capacities will not be exceeded.

Policy A

Expand the State's small boat harbor system, including launching ramps, taking into account analyses of the areas' carrying capacities and the economic efficiency of proposed harbors.

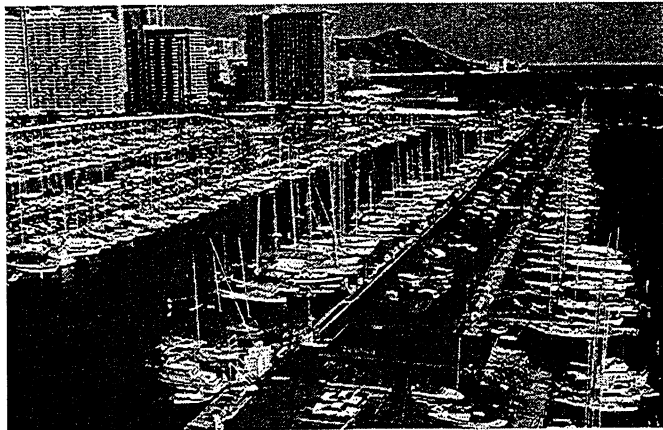
Implementing Actions:

DOT should:

1. Request that the Governor revive the Governor's Advisory Committee on Harbors and Ramps and charge them with providing recommendations for a statewide master plan for small boat harbors and private marinas. Membership on this committee should be limited to those with direct interest in the boating industry and community.
2. Based on recommendations of the Governor's Advisory Committee on Harbors and Ramps, prepare a statewide comprehensive plan for recreational public boat harbors, and private resort-based marinas. This plan should include: assessment of the requirements of private recreational boaters and the commercial

recreation industry; comparison of benefits between clustering and dispersing marinas along coastlines; statewide survey of possible sites on public shorelines and private property, and identification of possible locations for harbors of refuge.

3. As part of this planning process, encourage workshops with the local user communities and studies of the area's environmental and social characteristics, including carrying capacities of the surrounding areas.



4. Formulate a comprehensive State policy regarding development of private marinas. [OSP is currently developing such a policy and this should be done in cooperation with DOT, DBED, Counties and the Governor's Advisory Committee on Harbors and Ramps.]

5. Consider public need through the allocation of a certain number of slips to the public, or allow public use of the launch ramps and parking within or near private resort marinas.

6. Consider increasing the maintenance budget for small boat harbors, and consider financing this through an increase in user fees.

7. Establish an equitable user fee structure for all users of public small boat facilities. This may include charging fees to all users, including those using the launching ramps. The money from these users would continue to go directly to small boat harbor improvements.

8. Organize harbor user groups to clean up harbor facilities on a periodic basis. This would include boaters and private operators of harbor concessions.

9. Promote the development of more launching ramps and dry-stack storage units with public funds and in partnership with private companies.

10. Provide more launching ramps and parking areas for commercial recreational boat users within the metropolitan Honolulu area.

11. Work with the private sector to expand facilities for ocean yacht racing.

Policy B

Minimize the conflicts between harbor development and other ocean and coastal activities.

Implementing Action:

DOT should:

Increase the use of existing harbor advisory panels and establish such panels in harbors where they do not currently exist. (These panels are in addition to the Governor's Advisory Committee on Harbors and Ramps [see Policy A, Action 1].)

Policy C

Facilitate public-private partnerships and other alternative means for financing harbor development.

Implementing Actions:

DOT should:

1. Develop provisions for government incentives to induce private-sector investment in: marina infrastructure development; shore-based small boat storage facilities; and shoreline parks and park facilities.

2. Expedite development of the boat slips and offshore mooring areas currently proposed and critically needed.

DOT, in cooperation with OSP, DBED, and DB&F, should:

3. Formulate strategies to finance facilities that support economically valuable ocean-related or harbor industries (e.g., ship repair and construction, and small boat industries). Possible funding sources

include the Federal government, the State General Fund, and the private sector.

Policy D

Minimize and mitigate impacts of harbor development and operations on ecological and cultural resources.

Implementing Actions:

DOT, DOH and DLNR, in cooperation with UH, COE, the Counties, and private marina developers, should:

1. Seek to instate comprehensive and ongoing water quality and marine life monitoring programs for all existing and proposed small boat harbors in order to assess the environmental impact of such harbor development and operations.

DOT, in cooperation with DOH, DLNR, NMFS, and COE, should:

2. Provide funding for research on the potential environmental impacts of small boat harbor development, including impacts on marine mammals and sea turtles, and the linkage between harbor construction and *ciguatera* poisoning in the area.

DOT should:

3. Clarify with DOH the specific requirements for constructing marinas in Class AA waters.

4. Improve dissemination of research and monitoring findings to the public so that community members can have a greater understanding and awareness of impacts of small boat harbor development on the marine ecosystem.

5. Require that all private and public small boat harbors have facilities for disposal of sewage and oil, and that small boat harbors and launching ramps have receptacles for solid waste disposal, including separate receptacles for recyclable materials. Educational materials should be developed and disseminated. [See Waste Management section.]

6. Establish a comprehensive education program to make boaters aware of the importance of using disposal facilities for sewage and oil, and of bringing solid waste - including plastics - back to shore for proper disposal.

D. FISHERIES

Hawaii's ocean waters support diverse fisheries, available for subsistence, recreation and commerce. This abundance of marine life includes reef and nearshore species; bottom fish; pelagic fish including tuna, swordfish, *mahimahi* and *ono*; spiny and slipper lobsters; *ono* shrimp and spotted shrimp; Kona crabs; octopus; *opihiki*; and pink, gold, black and bamboo coral. There are two principal fishing regimes in the State: 1) the inshore and nearshore fisheries and 2) the offshore fisheries.

Hawaii's inshore and nearshore fisheries resources are very limited compared to offshore resources. Nevertheless, recreational shore fishermen made an estimated 1.4 million "trips," roughly double the number of "trips" made by private boats and charter vessels. While the total extent of Hawaii's offshore fisheries is difficult to assess, annual sustainable yields of fish in Hawaiian waters could be as high as 43 million pounds per year, a substantial resource for the State. About 19 million pounds of locally caught fish were marketed in 1989 with an estimated value of \$44 million. Takes of certain species have increased explosively. The total catch of swordfish for the first five months of 1990 is 50 times as large as the total catch during 1988. While vividly demonstrating the economic potential of Hawaii's fisheries resource, the State must also evaluate this dramatic increase in terms of the sustainment of fisheries stocks. Stocks must be managed to enhance use for future generations.

Fisheries within the State waters of the main Hawaiian Islands are managed by the State Department of Land and Natural Resources (DLNR), while Northwestern Hawaiian Islands fisheries are jointly managed by DLNR and the Federal government through the Western Pacific Regional Fishery Management Council (WESTPAC) and the National Marine Fisheries Service (NMFS).

A number of major problems inhibit optimal maintenance and development of Hawaii's ocean fisheries. The State's growing population has increased both fisheries exploitation and degradation of the marine environment, threatening resource sustainment. In addition, conflicts have re-



sulted between competing user groups, such as longline and trolling boats; commercial fishermen and sport fishermen; and fishermen and other commercial and ocean recreation users. Maintaining *konobiki* (Hawaiian fishing) rights requires special attention. The infrastructure support — both the physical (e.g., harbors, refueling docks, boat ramps) and the fiscal structure promoting Hawaii's commercial catch — is insufficient for fisheries management and development. Finally, existing fishing regulations are complex and difficult to implement and enforce properly.

Objective

Provide a foundation for developing an integrated State fisheries management system that ensures: 1) depleted and over-exploited stocks will be restored to sustainable levels; 2) fisheries resources will be harvested at their optimum sustainable yield; and 3) user conflicts will be minimized. [The most important feature of "optimum sustainable yield" is that it must be set at a level to prevent overfishing.]

Policy A

Assess the status and population dynamics of fisheries stocks (on an ongoing basis) and develop effective management regimes for inshore, nearshore and offshore resources.

Implementing Actions:

DLNR should:

1. Develop a comprehensive plan for the assessment, monitoring and manage-

ment of nearshore and inshore stocks building on the Main Hawaiian Islands Marine Resource Investigation.

- a. Accelerate the Main Hawaiian Islands Marine Resource Investigation focusing on clear management objectives.
 - b. Develop a feasible method for gathering catch and effort data for inshore and nearshore fisheries.
 - c. Develop an integrated management plan for the management of inshore and nearshore fisheries.
2. Work with the NMFS, WESTPAC and the commercial and recreational fishing communities to adequately monitor the status of offshore fisheries resources.
 - a. Establish better coordination of State and Federal compilation and analysis of fisheries statistics.
 - b. Develop a feasible method for gathering catch and effort data from recreational fishermen.
 - c. Develop a more effective mechanism for gathering commercial catch, effort and sales statistics.
 - d. Secure adequate resources to insure compliance with reporting requirements.
 3. Establish a mechanism for evaluating and improving the compilation and analysis of fisheries statistics to improve fisheries management.

Policy B

Assess the social and economic costs and benefits of a range of commercial and recreational fisheries development options to support the design of effective management and development regimes.

Implementing Actions:

DLNR should:

1. Commission a study of commercial and recreation fisheries options to assess the social and economic costs and benefits of a range of development designs.
2. Use the findings of the study to make changes in the management plan and fisheries regulations based on the plan.
3. Commission updates of the socio-economic analysis as needed.

Policy C

Coordinate private-sector, State and Federal fisheries development and management efforts.

Implementing Actions:

DLNR, in cooperation with DBED, NMFS and WESTPAC, should:

1. Evaluate the role and potential effectiveness of the Hawaii Fisheries Coordinating Council in light of changes in fisheries management structure based on the Ocean Resources Management Plan.
2. Make such changes in the mandate of the Coordinating Council as may be required to fit into the new management structure and to improve coordination of Federal, State, County and private-sector fisheries development and management.
3. In coordination with the State, develop recommendations for enhancing the role of WESTPAC in the management of Hawaii's fisheries.

Policy D

Ensure that native Hawaiian fishermen receive all the rights to which they are entitled.

Implementing Actions:

DLNR should:

1. Evaluate the findings of the WESTPAC study "Native Hawaiian Fishing Rights."
2. Review existing Federal and State regulations that may pertain.
3. If the above evaluation and review indicates Hawaiian fishermen should re-

ceive preferential rights in the U.S. EEZ surrounding the State, recommend changes to existing State and Federal regulations to afford such rights.

Policy E

Maximize the use of scientific and management resources.

Implementing Actions:

DLNR, with assistance from UH and other research and educational institutions, should:

1. Develop (or enhance an existing) roster of fisheries research and management resources.
2. Establish a research coordinating committee for DLNR or the participatory management body described above.
3. Develop a long-range fisheries research plan consistent with the integrated fisheries management plan and meet the needs of the fisheries management body to ensure more effective fisheries management.
4. Develop projects similar to the Main Hawaiian Islands Marine Resource Investigation to meet ongoing fisheries management needs.

Policy F

Ensure reasonable access to fisheries resources for subsistence, recreational and commercial fishermen as well as other recreational users (e.g., divers) and aquarium fish collectors.

Implementing Actions:

DLNR should:

1. Through a participatory planning effort involving representatives of various segments of the fishing community and other marine users, devise management regimes that provide reasonable access to fisheries resources.
2. Using such methods, conduct periodic reviews of fisheries management and regulatory mechanisms to ensure such mechanisms continue to meet Hawaii's fisheries management needs.

Policy G

Minimize and resolve user conflicts among fishermen and between fishermen and other ocean resource users.

Implementing Actions:

DLNR should:

1. Evaluate fisheries conflict resolution methods employed by other states and identify methods that might be adapted for use in Hawaii.
2. Develop a conflict resolution mechanism to resolve user conflicts among fishermen and between fishermen and other ocean users that enhances communication.
 - a. Formally establish such a mechanism through legislation or regulation.
 - b. Develop a screening system for use of such a mechanism.
 - c. Limit the time allowed for mediation or negotiation.
 - d. Ensure that the agreements resulting from negotiations or mediation are binding.
 - e. Develop a public awareness program to encourage the use of such a mechanism.
3. Review existing fisheries regulations and set up a system to review proposed regulations to ensure that user conflicts are minimized.
4. Evaluate the role and potential impacts of commercial fishing vessels, and regulate their influx if necessary.

Policy H

Support trade and investment promotion, seafood marketing support, and the promotion of sports fishing and fisheries-related tourism.

Implementing Actions:

DBED, in cooperation with DLNR, should:

1. Work with the commercial fishing community and seafood marketers to review existing trade and investment promotion activities and identify new opportunities for trade and investment promotion.
2. Develop a long-range plan for trade and investment promotion that encourages the development of fisheries resources.
3. Enhance existing trade and investment promotion efforts to encourage and expand commercial development of under-exploited species through commercial fishing, charter boat fishing and marine tourism.

Policy I

Restore depleted stocks and enhance existing stocks by developing an effective management regime.

Implementing Actions:

DLNR should:

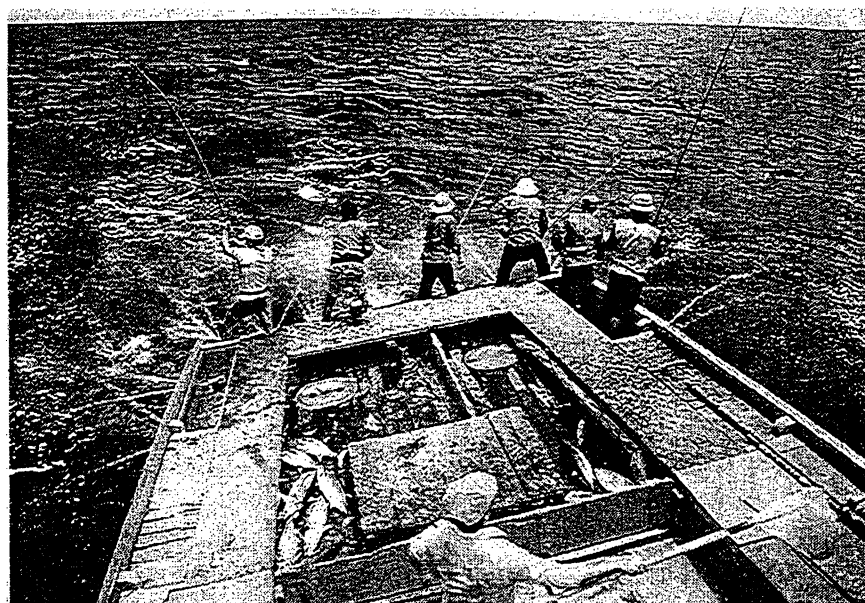
1. Develop a long-range plan for stock restoration and enhancement including consideration of the construction of artificial reefs and stocking of nearshore areas with cultured species.
2. Work with segments of the fishing community to develop a stock restoration and enhancement program.
3. Reevaluate existing fishing regulations with the goal of developing an effective and enforceable management system.
4. Develop an acceptable and enforceable system of closures to allow nearshore fisheries stocks to recover from over-exploitation.
5. Develop a public awareness campaign on fisheries regulations and the management of Hawaii's fisheries.
6. Develop a program for stock enhancement based on the plan.
7. Develop a public education program to encourage exploitation of under-utilized species and improved management of over-exploited species.

Policy J

Provide appropriate infrastructure for recreational and commercial fisheries development. [See Harbors section.]

Implementing Actions:

DOT, DLNR, and DBED together should:



1. Review the comprehensive fisheries management plan [see Policy A, Action 1] and existing harbor and marina development plans to ensure the needs of various segments of the fishing community are adequately met while the long-range fisheries development objectives can be achieved.
2. Develop a fisheries infrastructure development and finance plan that incorporates existing plans and integrates the development of commercial harbors, marinas, boat ramps, artificial reefs, fish aggregating devices (FADS) and other fisheries infrastructure.
3. Develop proposals for State, Federal and private-sector funding to implement the plan.
4. Establish a mechanism for ensuring coordination of infrastructure management under existing agencies or design

nate a single lead management agency to assume that function.

Policy K

Evaluate marine safety needs of commercial and recreational fishermen and facilitate developing programs to reduce accidents.

Implementing Actions:

DOT and DLNR, in cooperation with the U.S. Coast Guard, should:

1. Develop a voluntary marine safety training program for commercial and recreational fishermen.
2. Evaluate licensing and other procedures to improve marine safety on commercial and recreational fishing boats.
3. Develop public awareness programs to encourage participation in training programs and proper maintenance of equipment.

E. MARINE ECOSYSTEM PROTECTION

Hawaii's marine and coastal environments are crucial to the economy and integral to its history and culture. Historically, these environments defined communities and provided many of the resources upon which the traditional economy depended. More recently, the tourism industry, which now contributes significantly to the State's economy, has become dependent upon quality marine and coastal environments. The resources contained within these natu-

ral environments are diverse and numerous: marine life, including marine mammals, sea turtles, birds and fishes; endemic and exotic plant species; critical and productive habitats such as coral reefs, estuaries, wetlands, offshore islets and rocks, and anchialine pools; scenic land and seascapes, including beaches, rugged shorelines and underwater lava formations; and deep seabed minerals.

A range of values – some quantifiable and others not – can be placed on these resources. Marine and coastal resources maintain economic as well as scientific and

educational value. Scientific studies generate important geologic, oceanographic and ecological data; research and development projects can translate into technological innovations; and public education programs cultivate heightened environmental awareness. Resources are also valued for their role in ancient cultures and, hence, have historic and cultural worth. Natural resources possess recreational and aesthetic values as well, and play a crucial role in maintaining the overall balance of ecological processes.

Hawaii's coastal and marine environments are managed by a number of Federal, State and County authorities. Key Federal agencies include the U.S. Fish and Wildlife Service (FWS), the National Park Service (NPS) and the National Oceanic and Atmospheric Administration (NOAA) through National Estuarine Research Reserve and National Marine Sanctuary Programs. State agencies include the Hawaii Coastal Zone Management Program (CZM) in the Office of State Planning (OSP), Department of Land and Natural Resources (DLNR), and the Department of Health (DOH). County authority is vested in the planning departments (Kauai, Maui and Hawaii) and the Department of Land Utilization (DLU) of the City and County of Honolulu.

The management and protection of significant marine and coastal areas has not kept pace with the rapid development of marine and coastal resources. A number of management issues and sub-issues must be addressed before the marine and coastal resources of Hawaii will fully realize their economic, educational, scientific, recreational, cultural and ecological values. Coastal developments and activities continue to damage and destroy ocean and coastal species and habitats. Existing ocean and coastal management plans and activities are inadequate and need to be better integrated. Natural resources are severely overused in some areas with inadequate research, inventory, monitoring and enforcement efforts by government agencies. Finally, Hawaii clearly lacks public education and involvement in marine and coastal protection programs.

Objective

Provide for protection of marine and coastal ecosystems, and establish a comprehensive system of marine and coastal protected areas within an integrated program which protects, preserves and enhances marine species and areas of exceptional resource value on each main island, representing each of the natural ecosystems and resources found in the marine and coastal environment of the State.

Policy A

Expand protection of species, natural habitats and other resources of exceptional value, thereby minimizing environmental degradation from marine and coastal activities and uses.

Implementing Actions:

DLNR and OSP should:

1. Prepare a comprehensive and cohesive statewide master plan for marine and coastal protected areas which can be incorporated into an overall management plan in order to balance protection and use of marine and coastal resources. The master plan should both expand upon the existing system and incorporate new types of marine protected areas which will protect such features as unique underwater geological formations and archaeological sites, as well as coastal areas from which whale-watching and other coastal-recreation activities can occur. This planning process should include at least the following actions:



- a. Convene a State policy and management workshop to establish criteria for selecting marine and coastal protected areas.

- b. Identify areas of exceptional resource value which should be considered for protected area status. This inventory of unique and representative examples of natural ecosystems and resources found in Hawaii's marine and coastal environments can be prepared as part of the overall coastal resources inventory within the State's Geographic Information System (GIS) program. Identify natural areas in need of restoration, prioritize these areas, and implement restoration programs.

- c. Establish a system of marine and coastal protected areas throughout the State to protect the best examples of these natural ecosystems and resources on each island.

- d. Establish site-specific management plans, within the framework of the statewide master plan, for each marine and coastal protected area, using a methodology such as "Limits to Acceptable Change" to establish appropriate carrying capacities. Include within these plans descriptions of allowed commercial and recreational uses.

- e. Uphold the original goal of the Marine Life Conservation District (MLCD) program, which is resource

protection, by establishing use-limitations so that marine resources within these districts are adequately protected. Those current MLCDs that are intensely used are more appropriately managed as underwater parks; new MLCDs should be designated for protection of marine resources. The original goals of the Natural Area Reserve System (NARS) and Fisheries Management Area (FMA) programs should also be upheld.

- f. Review the existing State Seabird Sanctuary system to determine appropriateness of rules and management policies and feasibility of adding new units to the system to protect seabird and other wildlife resources.

g. Establish a statewide system of day-use mooring buoys to protect reefs from anchor damage. DOT is presently working with The Ocean Recreation Council of Hawaii (TORCH) and the Mooring Pin Advisory Committee on this project, as required by House Concurrent Resolution No. 21, 1990. [See Ocean Recreation section.]

h. Identify species of high commercial and recreational values and provide these species and their habitats with adequate protection to ensure the continued economic viability of their dependent industries.

i. Continue working with the aquarium fish collecting industry to develop a management plan which establishes guidelines and regulations of collection techniques, frequency of collection at a given site and limits to collection of certain species.

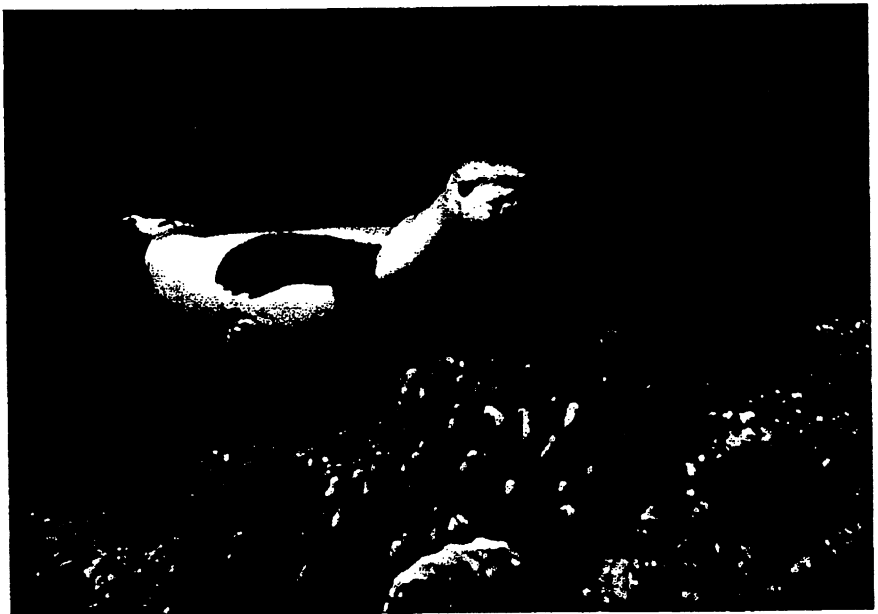
2. Request the Legislature to increase funding to: DLNR State Parks Division in order to improve the management of underwater parks; and DLNR Division of Forestry and Wildlife in order to improve management and enforcement of the State Seabird Sanctuary system.

3. Work with the Counties planning commissions, and planning departments (City Council and DLU for the City and County of Honolulu), to establish coordinated marine life and water quality monitoring programs to provide a comprehensive data base regarding the quality of Hawaii's marine and coastal resources. As part of these programs:

a. Require monitoring before, during and after construction of coastal developments in order to obtain a better data base for understanding the numerous and cumulative impacts of these coastal developments on fringing reefs, anchialine pools and other natural resources.

b. Support research into the effects of coastal development on the quality of nearshore waters and marine life.

4. Establish an effective response program for handling spills of oil and other hazardous substances in order to minimize damage to the marine and coastal environments. [See Waste Management section.]



5. Coordinate with and encourage Counties planning departments (DLU for the City and County of Honolulu) to:

a. Establish appropriate development controls for areas inland of marine and coastal protected areas to prevent non-point source pollution through runoff or groundwater contamination.

b. Incorporate habitat protection of endangered and threatened coastal and marine flora and fauna into County planning efforts.

c. Ensure that protection of open coastal spaces is included in County plans.

d. Evaluate development along entire river watersheds to ensure that estuaries will not be receiving large amounts of cumulative pollutants.

6. Evaluate the feasibility of leasing submerged lands to private, non-governmental organizations (e.g., the Nature Conservancy) for management as a marine protected area.

Policy B

Facilitate coordinated and comprehensive inter-agency management where jurisdictional overlaps exist between Federal, State and County governments in marine and coastal protected areas.

Implementing Actions:

DLNR and OSP, in conjunction with appropriate Federal, State and County agencies, should:

1. Coordinate with Counties in designating and managing marine protected areas adjacent to coastal County parks; coordinate with NPS and FWS in designating and managing marine protected areas adjacent to coastal National Parks and National Wildlife Refuges; and coordinate with other State agencies in designating and managing marine protected areas adjacent to coastal State parks.

2. Facilitate and coordinate Federal, State, and private-cooperative research and monitoring efforts at developing baseline information regarding the locations of critical habitats of endangered and threatened species. Encourage the designation of these critical habitats as protected areas.

3. Encourage joint efforts of Federal, State, County, private and community involvement in marine life and water quality monitoring programs.

4. Organize statewide management workshops with Federal, State, County and private managers to address significant management issues and develop improved management tools such as:

a. A policy for protecting wetlands from development

b. A strategy for maintaining open ocean space.

c. Other policies governing the uses of resources of shared interest.

Policy C

Improve enforcement of regulations protecting marine and coastal protected areas and species.

Implementing Actions:

DLNR should:

1. Request the Legislature to increase funding for enforcement of marine conservation and preservation regulations to provide more personnel and equipment for more comprehensive enforcement.
2. Request the Legislature to increase funding for management and educational programs addressing marine and coastal protected areas and species; and encourage Federal and private funding of such efforts.
3. Establish Memoranda of Understanding (MOUs) between Federal and State agencies to enable personnel from these agencies to enforce both State and Federal regulations.
4. Coordinate community and private-sector involvement in monitoring and enforcement of regulations.
5. Budget funds to staff and publicize the toll-free number available to the public to report sighted violations of regula-

tions. This should be done in cooperation with the existing NMFS program for reporting violations of regulations concerning marine mammals and sea turtles.

6. Identify remote areas in need of more frequent patrolling.
7. Review penalties for adequacy and appropriateness.

Policy D

Enhance local community awareness, appreciation, and participation in marine conservation and preservation efforts.

Implementing Actions:

DLNR should:

1. Request the Legislature to appropriate funds for improving public education programs in schools and elsewhere, to increase public awareness and appreciation of marine resources and conservation. [See Ocean Research and Education section.]
2. Encourage public participation programs such as "Coast Watch" or "Adopt-a-Shoreline" as ways to enhance public understanding of marine conservation and enforcement of rules.
3. Encourage programs which empha-

size the cultural and historical values of Hawaii's marine and coastal resources. For example, seek programs which revitalize ancient Hawaiian fishponds to grow *opae'ula* (red shrimp) using traditional methods as a means of historical preservation. This must include solving siltation and runoff problems, and could be a part of interpretive programs at parks or resorts, rather than as commercial ventures.

4. Facilitate the process for public comment on the adequacy of Environmental Assessments and on Negative Declarations.

5. Facilitate the process for public comment on adding to or removing lands from the Natural Area Reserve System.

6. Change the administrative procedure to allow for a public comment period for species recovery plans.

7. Encourage public involvement in the development of overall and regional ocean and coastal management plans.

8. Support the development of interpretive centers, especially at protected areas, to educate the public on the uniqueness of Hawaii's marine resources. [See Research and Education section.]

F. BEACHES AND COASTAL EROSION

Hawaii's beaches and shoreline in general are invaluable resources upon which much of our Island way of life depends. Tourism is dependent on the pristine quality of our ocean and the imagery of beautiful beaches. Residents depend on beaches and the shoreline for recreation and other uses. Ecologically, the shoreline areas are important as habitats for animals and plants, some of which are rare Hawaiian endemic and indigenous species. Erosion and accretion are an integral part of beach formation, reflecting the dynamic interaction between volcanism, winds, waves, precipitation and storm events. Human developments along the coastline interpose structures and private property in this dynamic zone to protect life and property from these natural ongoing processes.

Hawaii's beaches and shoreline are managed by a range of Federal, State, and County authorities. The U.S. Army Corps of Engineers



(COE) is the major Federal authority, while key State agencies include the Office of State Planning's (OSP) Hawaii Coastal Zone Management Program (CZM) and the Departments of Land and Natural Resources (DLNR), Transportation (DOT), and Health

(DOH). County authority is vested in the planning departments (Department of Land Utilization (DLU) of the City and County of Honolulu).

Management issues fall into the categories of: 1) resource sustainment; 2) use con-

flicts; 3) ineffective management; and 4) participation and education. The primary underlying issue identified is the "hardening" of the shoreline due to erosion control structures and the subsequent loss of lateral public access to the shoreline. The issue is commonly portrayed as a public vs. private use conflict since erosion control structures (the worst being seawalls) are most often constructed on private property only to result in further or accelerated erosion of public beaches.

Management strategies to deal with the issue of shoreline "hardening" and lateral access to the shoreline have been ineffectual at best. Historically, overlapping jurisdictions, blurred jurisdiction and shoreline boundaries, and a lack of enforcement have been problems. Regulatory "grey areas" critical to management include a problematic shoreline certification process and nearly automatic "hardship" variances for construction of erosion control structures within shoreline setbacks. The lack of public education and participation also are seen as critical management issues.

Objective

Develop an integrated State erosion management system that ensures: 1) the preservation of sandy beaches and public access to and along the shoreline; and 2) the protection of private and public property from flood hazards and wave damage.

Policy A

Establish and maintain a comprehensive coastal shoreline survey, database, and other research.

Implementing Actions:

OSP, in cooperation with DLNR, should:

1. Give high priority to the identification and characterization of chronic erosion and inundation areas throughout the State so that regulatory and structural mitigation measures can be implemented as soon as possible.
2. Establish and maintain a statewide database for aerial photography and coastline studies, and classify each area of the shoreline according to level of erosion and inundation risks.
3. Set priorities for and monitor basic research on beach processes, littoral cell sand production and movement, risk assessments [see Policy D], and baseline

coastal erosion and cartography.

4. Obtain standardized and digitized data from University and other researchers for inclusion in the statewide ocean and coastal Geographic Information System (GIS).

5. Provide for easy access to data and databases both for resource managers and the general public.

6. Further identify and inventory offshore sand resources.

7. Carefully examine the application of the Bruun rule (i.e., that sea-level moves inland up to one hundred units for every one unit of rise) to various shoreline types across the State based on a range of possible scenarios for sea-level rise.

Policy B

Coordinate County, State, and Federal erosion- and beach-management efforts.

Implementing Actions:

OSP should:

1. Work cooperatively with the Counties and other State agencies in establishing and implementing a consolidated permit application, review, and approval system for erosion-control structures and setback developments.
2. Explore regulatory and economic incentives, including strategies being used in other coastal states such as:
 - a. Tax incentives;
 - b. Insurance rates;
 - c. Hazard ratings.

Policy C

Exercise greater enforcement of laws and regulations.

Implementing Actions:

DLNR should:

1. Work closely through their representatives to implement a uniform permit system. [See Policy B, Action 1.]
2. Collaborate with and act on recommendations to limit erosion-control structures.
3. Increase the level of negative sanctions to be applied against law and regulation violators (including structure demolition, fines, and other civil penalties).

4. Seek greater funding for personnel, site visits, and monitoring of shoreline alterations. [See Policy I.]

Policy D

Ensure the continued natural production of sand and assess the potential for using beach replenishment.

Implementing Actions:

OSP, in cooperation with DLNR, DOT and the Counties, should:

1. Continue scientific research programs to explore the mechanisms and to assess the current rates of sand production.
2. Select non-rural hazard areas and chronic eroding and unstable beaches for sand replenishment pilot projects and monitor impacts on littoral cell dynamics.
3. Establish projects to stabilize littoral cell sand balance in hazard, chronic erosion, and unstable areas by:
 - a. Removing unsound erosion structures and/or
 - b. Importing sand of similar types from offshore sources.
4. Restrict the taking of sand by individuals in sensitive ecological and high use areas.
5. Prohibit the use of motorized off-road vehicles within the shoreline setback area.

Policy E

Promote an erosion-control structure limitation strategy.

Implementing Actions:

OSP, in cooperation with DLNR, DOT and the Counties, should:

1. Identify for management purposes, districts designated as hazard, chronic erosion, unstable beach, accreting beach, and stable beach areas.
2. Establish "Special Improvement Districts" for the development of uniform (standardized and aligned) erosion structures for hazard, chronic erosion, and unstable beaches.
3. Establish a cooperative program with County and Federal authorities to restrict new physical erosion structures except in designated hazard areas.



4. With County lead agency cooperation, have all illegal erosion control structures modified to meet requirements or removed.
5. Develop a management policy regarding offshore structures such as sand grabbers and artificial reefs.

Policy F

Develop an active public participation and education program to preserve and protect beaches.

Implementing Actions:

OSP should:

1. Establish an advisory committee of public interest groups, public and private school and university educators, and nonprofit agencies to help guide the education program.
2. Establish a public education program on beach and erosion processes and issues including:
 - a. Flood and erosion hazard television spots and brochures;
 - b. District and neighborhood "Adopt-a-Beach" programs and activities.
3. Establish a public participation program for input into erosion and beach programs planning through:
 - a. Statewide participatory planning debates on specific issues via newspapers, television, and radio shows;
 - b. Statewide public long-range planning workshops.

Policy G

Expand open space and shoreline setbacks.

Implementing Actions:

OSP, in cooperation with DLNR and the Counties, should:

1. Explore and evaluate options for expanding the shoreline setback in agricultural, rural, and conservation lands for open space purposes.
2. Explore and evaluate options for establishing an expanded variable setback based on annual erosion rates, coastal characteristics, and potential sea-level rise.
3. Seek legislative funding for strategic land acquisitions along the coastline where world-class resources exist.
4. Develop a disaster plan (and necessary legislation) which would call for acquisition of shoreline properties where improvements are destroyed by hurricane or tsunamis.
5. Work with the Counties to limit through regulation (or legislation, if necessary) shoreline subdivision activity.

Policy H

Maintain and develop access to beaches and along the shoreline.

Implementing Actions:

OSP, in cooperation with DLNR, DOT and the Counties, should:

1. Establish a statewide policy requiring new erosion-control structures (where possible) to provide means of lateral shoreline access (e.g., steps, walkways).
2. Encourage through beach replenishment, sand production, and structure abatement, natural means of lateral access to the shoreline.

Policy I

Assure adequate funding resources and personnel.

Implementing Actions:

OSP, in cooperation with DLNR and DOT, should:

1. Seek increased legislative funding for line management functions.
2. Seek funding specifically for shoreline erosion and beach management, especially for enforcement.
3. Seek legislation which would establish an account separate from the State General Fund for fines and penalties which could then be used by the enforcement agency.
4. Seek continued Federal funding for coastline research.
5. Enroll in the FEMA (Federal Emergency Management Agency) Flood Insurance relocation option program authorized by the Upton-Jones amendment or otherwise develop incentives to relocate structures inland of chronic erosion zones.
6. Explore a range of other funding avenues including:
 - a. Beach maintenance taxes;
 - b. Impact fees;
 - c. County and State cost-sharing;
 - d. Park user fees.

Policy J

Plan for climate change, sea-level rise, and emerging issues.

Implementing Actions:

OSP should:

1. Identify agency personnel to monitor and track the scientific research on global climate change and sea-level rise and emerging issues.
2. Engage in long-term planning exercises — with senior planners, planning staff, and scientific experts — which take into account a range of possible geological and climatic changes.
3. Involve the public in educational and participatory planning activities which explore the consequences of climate change and sea-level rise.

G. WASTE MANAGEMENT

To some extent, the ocean has the capacity to store, biodegrade, dilute, or disperse various wastes without adverse impacts upon coastal communities and ocean resources. Treated municipal sewage effluent, oil, plastics, dredge spoils and radioactive wastes are types of wastes that have been or are being disposed of in the ocean surrounding Hawaii. The nearshore waters receive pollutants from point sources, such as sewage outfalls and non-point sources, such as soil erosion and urban runoff. As Hawaii's population grows, the amount of waste produced increases. At the same time, the State's disposal capacity is decreasing - landfills are filling up and sewage treatment plants are reaching their design capacity limits.

In general, waste management practices involve disposing wastes in a place that can benefit or, at the very least, minimize harm to the environment and to human health. Protecting the environmental quality of Hawaii's nearshore waters is essential to maintaining the economic health of the State and our standard of living. Tourism, ocean recreation, fisheries, aquaculture, ocean thermal energy conversion and ocean research and development all depend on clear, pollution-free waters.

The State Department of Health (DOH) has the major responsibility for regulating the management of wastes and ensuring water quality is protected for all coastal waters. Other State agencies involved in ocean and coastal waste management activities include the Department of Land and Natural Resources (DLNR) and the Department of Transportation (DOT), which have programs to control plastic debris in the ocean. Key Federal authorities include the U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA).

A number of management issues are currently being debated. Lack of coordination among Federal, State, and County agencies, insufficient funding, and non-standard management practices are shared problems among a number of waste management programs. In cases of spills (oil and chemical spills), the State's legal authority and administrative capability to protect natural resources is unclear. In addition, existing wastewater treatment facilities are reaching their capacity limits and are poorly maintained. Finally, the



public lacks general information and involvement in issues concerning waste management and its impact on the environment.

Objective

Ensure that the State is capable of effectively regulating waste disposal, and accidental oil and chemical spills, while protecting human health and minimizing environmental degradation.

Policy A

Minimize point and non-point source pollution and its accompanying impacts on the ocean and coastlines by developing appropriate regulatory controls, incentives, monitoring, and research programs.

Implementing Actions:

DOH should:

Water Quality

1. Monitor and provide input on proposed changes to Federal statutes and regulations regarding water quality and waste disposal.
2. Sponsor regional and State workshops to review existing DOH and other monitoring programs in order to establish a comprehensive water quality and marine life monitoring program for all coastal waters.
3. Fully implement the water quality monitoring program in the Clean Water Branch. This would require additional funding from the Legislature.

Municipal Sewage Treatment

4. Work with the Counties to upgrade sewage treatment facilities and build new facilities. This may require additional funding from the Legislature.
5. Convene a statewide policy and management workshop on the relative costs and benefits of primary and secondary sewage treatment, and alternatives including leach fields and the use of sewage sludge as composted fertilizer.
6. Work with Counties to develop alternative funding mechanisms for constructing additional sewage treatment facilities as building development continues.
7. Increase training and career advancement incentives for treatment facilities operators.
8. Implement the revised Chapter 11-62 Hawaii Administrative Rules (HAR) which describes the boundaries of Critical Wastewater Discharge Areas on each island.
9. Encourage each County to maintain adequately trained environmental engineers to evaluate proposed individual wastewater treatment systems.

OSP should:

10. Work with the Counties to ensure that sewage treatment facilities have adequate capacities to handle incoming waste volumes in order to prevent discharges of untreated sewage into

nearshore waters. This will require coordination of planning for housing development with planning for infrastructure development.

DOH should:

Individual Wastewater Treatment Systems

11. Work with the Counties to support the use of non-cesspool alternative methods of domestic sewage treatment. This would need to be accomplished through the implementation of wastewater rules which allow for these types of systems.

Municipal Solid Waste

12. Establish solid waste management standards that Counties would be expected to meet in developing their solid waste management plans, including site selection and closing criteria for landfills.

13. Ensure that municipal solid waste incineration - including smokestack emissions and ash disposal - is fully monitored and monitoring information is readily available to the public.

Hazardous Waste

14. Establish an effective monitoring program for all hazardous or toxic wastes. To do this the Legislature should increase funding and staffing for DOH programs. [This would enable DOH to increase its monitoring of all hazardous waste treatment/storage/disposal centers and ensure proper treatment, storage and disposal of wastes.]

15. Work with industry to develop incentive programs to minimize hazardous or toxic wastes and to develop spill prevention, preparedness and response capabilities.

16. Develop an effective enforcement program for hazardous waste regulations.

17. In the event of hazardous waste incineration, ensure that plants - including smokestack emissions and ash disposal - are fully monitored and monitoring information is readily available to the public.

Radioactive Wastes

18. Establish a management program for overseeing the collection, transportation, disposal and monitoring of all radioactive wastes.

Non-point Source Pollution

19. Improve the effectiveness of the non-point source pollution control program. To do this, the Legislature should increase funding to DOH: to prioritize and address non-point source pollution issues; for State personnel for the program; and for research into the impacts of various land uses on nearshore habitats.

Litter Control

20. Establish a program to identify and regulate sources of unregulated waste disposal, including fishing gear, mass release of helium filled balloons, and onshore and offshore littering.

Policy B

Promote waste minimization through source reduction, recycling, and other alternative methods of waste management as part of the State's regulatory programs.



Implementing Actions:

DOH should:

Wastewater Treatment

1. Support water reclamation through a variety of methods, including artificial marshes, sedges, water hyacinths and other plants as means of absorbing nutrients contained in primary treatment effluent, in addition to the current practice of using this effluent in golf course irrigation.

2. Support the utilization of sewage

sludge, after proper treatment, as composted fertilizer.

Municipal Solid Waste

3. Work with the Counties to establish redemption centers for recyclable materials, including plastic, paper, glass, aluminum, and used motor oil.

4. Work with the Counties to provide incentives for recycling and composting.

5. Coordinate regulatory controls and incentive programs to discourage illegal dumping of oil, sewage from vessels, plastics and other waste into ocean and coastal waters.

DOT should:

6. Provide incentive programs to encourage commercial and recreational vessels to bring plastic wastes and sewage back to port for proper disposal.

7. Require the establishment of facilities

for sewage and used oil, along with receptacles for solid waste, separated into plastic, paper, aluminum, and glass, at all small boat harbors and boat ramps. At the same time, develop educational programs for boaters about the benefits of utilizing these facilities. [See Harbors section.]

DOH should:

Hazardous Waste

8. Support programs to reduce the production of hazardous wastes in the State's

industries. Use waste audits to pinpoint the sources of hazardous waste in different industries. Offer incentives for industries to take preventive steps such as raw material substitution, process redesign, product redesign, *in situ* recycling, and enhanced containment during transfer and processing.

9. Establish a free and convenient collection system for household hazardous wastes, such as pesticides, paints, and solvents.

Policy C

Be prepared to respond effectively to spills and other discharges involving oil and other hazardous materials in the State's waters.

Implementing Actions:

DOH should:

1. Increase staffing for the department's Office of Hazard Evaluation and Emergency Response (HEER). This would require additional funding.
2. Arrange for HEER to contract services for natural resources damage assessment from spills.
3. Clearly articulate in the rule-making procedure for the State Emergency Response Law that the department has the authority and responsibility to respond to spills or releases that may harm natural areas without clear threat to human health. [These rules and responsibilities for protection of natural resources also need to be integrated with the existing authority of DLNR.]
4. Initiate a program to evaluate and take action on the hazardous waste problems in all Federal facilities in Hawaii in cooperation with the COE.
5. Identify those hazardous waste cleanup sites that should be included in the State and National Priority List for Superfund sites.
6. Conduct an economic impact assessment study to determine the impact of an oil spill in specific areas, such as Waikiki. This would help the State determine how much money it is willing to pay for prevention.
7. Conduct a study with Federal, State and County agencies, and petroleum shippers and refiners to approximate the

probable risks of various categories of oil spills. This would require close and candid cooperation between industry representatives, the USCG and State representatives.

8. Review existing response plans and approved strategies for oil spill response. This should include an ongoing effort to monitor technical literature for innovations in coping with monitoring, containment, recovery and clean-up of oil spills.
9. Evaluate actual oil spill response capacity in the State or available to the State on short (12 hour) notice. Allocations to upgrade capacity in either State or Federal agencies, or in the private sector must be based on a realistic appraisal of what already exists, its suitability for Hawaii and the probabilities that it might be needed.
10. Work with Federal agencies to devise incentives for the oil industry to enhance the procedural safety of oil shipments, and to ensure immediate reporting not merely of spills, but of high-spill-risk situations.
11. Work with the U.S. Coast Guard to expedite the sampling process for identifying spill sources.
12. Establish a grievance mechanism to provide a forum for citizens to seek compensation when they are affected by spills.

Policy D

Enhance public awareness and participation with regard to sources and effects of marine pollution, as well as methods and programs for waste disposal and cleanup.

Implementing Actions:

DOH should:

1. Seek increased funding from the Legislature for its public education program to enhance public awareness of wastewater disposal facilities and environmental programs and the effects of marine pollution on the environment. Such programs should also encourage public participation in clean-up activities.
2. Increase support of community programs such as "Adopt-a-Beach" (e.g., trail, storm drain, etc.).
3. Make water quality monitoring infor-

mation, which analyzes trends and identifies problem areas, readily available to the public in an easily understandable form.

4. Establish a toll-free number for citizens to report violations of waste disposal regulations.
5. Incorporate public comment into the preparation of long-term toxic waste clean-up plans.

Policy E

Ensure cooperation among regulatory and management agencies within the State, and among Federal, State, and County agencies.

Implementing Action:

DOH should:

Conduct a comprehensive review of waste management regulations, procedures, and programs at the County, State, and Federal levels to identify the gaps and overlaps as well as opportunities for improved cooperation and information-sharing among the agencies.

H. AQUACULTURE

Aquaculture is the farming of aquatic organisms. It is currently one of the fastest growing industries in Hawaii. In 1989, the industry generated over \$21 million of income. Of that, the 22 Hawaii-based firms engaged in the industry's technical support and consulting sector earned \$14 million; the other \$7 million was earned by the 50 firms currently engaged in actual production, employing over 500 people. The culturing of more than 35 different species, including freshwater prawns and marine shrimp, is underway.

Hawaii has an abundance of aquaculture-related resources including a virtually unlimited supply of pathogen-free seawater, year-round temperatures suitable to tropical, subtropical, and temperate species, and a land base sufficient to establish a wide variety of aquaculture developments. Furthermore, Hawaii's ancient culture historically pursued aquaculture for subsistence; many of those fishponds still exist, and may yet be reclaimed for use. Finally, fish and other ocean products historically comprise a major part of the diet for a majority of Hawaii's diverse ethnic groups.

Several key agencies within the State directly affect aquaculture development. The Department of Land and Natural Resources (DLNR) is the lead agency responsible for aquaculture development. DLNR also oversees use of conservation district lands and allocates ground water use in some cases. The Department of Agriculture (DOA) administers the Aquaculture Revolving Loan Fund to help finance commercial aquaculture activities. DOA also requires permits for the importation of non-indigenous species of aquatic animals that might be used in aquaculture. The Department of Business, Economic Development and Tourism (DBED) provides a supportive role in aquaculture development through the activities of the Natural Energy Laboratory of Hawaii Authority, the Ocean Resources Branch, and the department's business development and financial assistance programs. The Department of Health (DOH) is responsible for assessing environmental impacts, regulating effluent discharge permits and exemptions, and overseeing sanitary production proto-

cols for shellfish. The Hawaii Coastal Zone Management Program (CZM), in the Office of State Planning (OSP), oversees objectives for managing and maintaining the coastal zone environment which apply to County and Federal as well as to State agencies. In addition, County planning commissions and land utilization agencies are responsible for zoning and land use applications.

Land availability is a major issue facing the aquaculture industry. More than 635,000 acres have been identified as potentially suitable, but availability is less than one-tenth of one percent of that. In addition, the lack of a State priority among the various freshwater uses — e.g., residential, recreational, and agricultural activities (including aquaculture) — has resulted in increased competition and conflict among these users. Ancient and modern rights of public access to ocean and coastal resources, and potential environmental impacts also pose concerns for further industry development. Overlapping regulatory regimes complicate and slow aquaculture development.

Objective

Develop an integrated approach to manage the impacts associated with an expanded aquaculture industry in Hawaii, while maintaining the viability and integrity of the environment.

Policy A

Assess the economic, social, and environmental costs and benefits of expansion in the various sectors of the aquaculture industry.

Implementing Actions:

DLNR should:

1. Identify the positive and negative impacts of expanding the various sectors of the aquaculture industry.
2. Establish priorities for support of the various industry sectors.
3. Create a coordinated development strategy to direct the industry along the path most beneficial to the economic, social, and environmental well-being of Hawaii.
4. Consider the needs of the aquaculture industry for fresh water in relation to competing water uses.

Policy B

Mitigate user conflicts between the aquaculture industry, fishermen, and the public at large.

Implementing Actions:

DLNR should:

1. Investigate alternative means to resolve disputes between these communities.
2. Investigate the feasibility and desirability of expanding the Ocean Leasing Law to allow commercial aquaculture facilities in nearshore waters.
3. Encourage new aquaculture farms and facilities to begin a dialogue with affected community groups early in the development process.

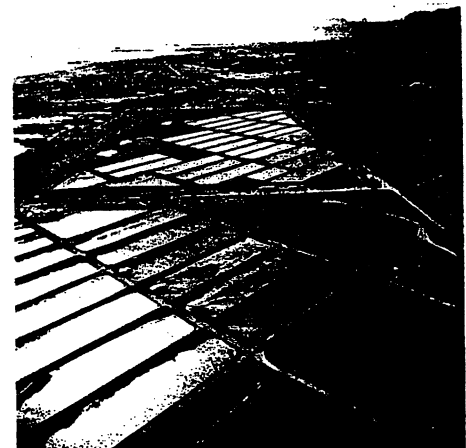
Policy C

Assess the impacts of aquaculture on the Hawaiian ecosystem.

Implementing Actions:

DLNR, in cooperation with DOH, should:

1. Investigate the environmental effects of aquaculture effluent discharge now occurring in Hawaiian waters.
2. Evaluate State regulations governing discharges and suggest possible changes to Federal and County regimes.
3. Develop a strategic and coordinated management plan to prevent adverse environmental impacts from aquaculture discharges, such as the identification and development of suitable sites around the State.



I. ENERGY

Hawaii's ocean waters are a major energy resource. Of the conventional energy sources — petroleum, natural gas, coal — Hawaii has absolutely no reserves to answer its energy demand. The only indigenous sources of energy available to the State are solar power; windpower; geothermal power; biomass; and the various "water powers": hydropower, Ocean Thermal Energy Conversion (OTEC), and tidal and wave generators. While the State supports many forms of alternative energy research and development, it has undeniably focused on the ocean. During the 1980s, Hawaii became the premier site for research and implementation on OTEC electrical generation. In a state where the greatest energy demand lies in the transportation sector, OTEC's capacity to displace fossil fuel use will be limited for the next decade. Nonetheless, the ocean has much to offer the future in comparatively clean, renewable alternative sources of energy, through OTEC and through other marine energy technologies.

In addition, the conventional energy facilities already in place in the State affect the ocean directly in a number of ways. Oil-burning electrical generation plants are sited near the ocean and use ocean water for cooling systems. Hawaii's primary energy source, crude oil, arrives entirely by tanker. Statewide use of Hawaii's geothermal energy resource is possible given development of advanced transport systems — either design and deployment of what will be the world's deepest underwater power transmission cable, or design and deployment of hydrogen storage and shipping systems. Appropriate ocean management policies and appropriate energy strategies for the State must recognize the ocean's potential as an energy resource, and also its present relation to existing energy facilities.

Within the State, responsibility for ocean energy resources development and management is shared by the Department of Business, Economic Development and Tourism (DBED), the Department of Land and Natural Resources (DLNR), the Department of Transportation (DOT) and the Department of Health (DOH). The Public Utilities Commission (PUC) establishes rates for electricity sales. The four County planning departments [Department of Land Utilization (DLU) for

the City and County of Honolulu] oversee use and development within their respective Special Management Areas (SMA), authorized under the Hawaii Coastal Zone Management Program (CZM) in the Office of State Planning (OSP).

The Hawaii Ocean Resources Management Program encourages optimal development and use of the state's ocean energy resources. The primary ocean energy resources to consider currently are OTEC, tidal and wave power generation, and marine biomass. Development of ocean energy resources, and of the State's energy sector generally, faces five major issues. First, siting and use conflicts with regard to energy facilities arise over the disruption of view planes and concerns over effluent discharge. Second, possible ocean-energy-related environmental impacts, such as redistribution of ocean nutrients or thermal pollution require impact assessment and amelioration strategies. Third, inadequate coordination of data acquisition, consolidation, and dissemination hampers

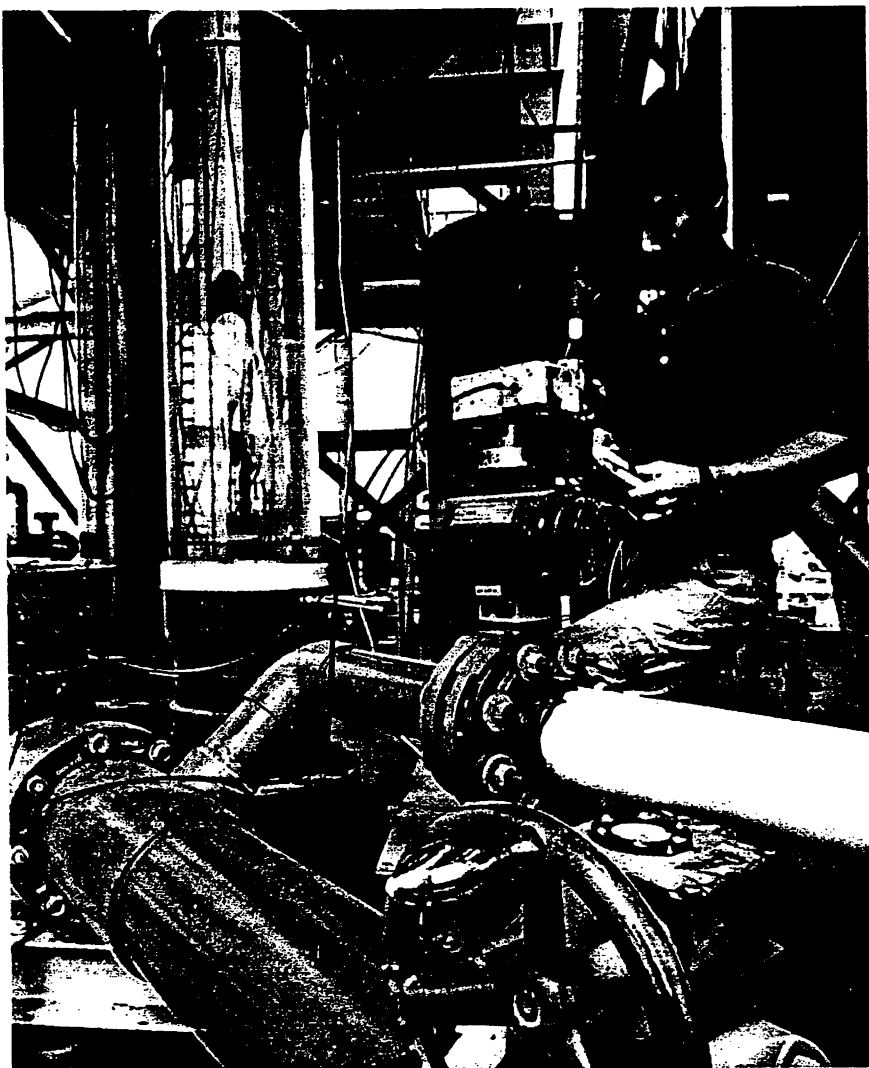
effective ocean-related energy management and development. Fourth, the current overlapping jurisdictions and authorities complicate both ocean energy development and response to ocean-energy-related issues. Finally, limited funds, labor, and equipment constrain effective management and development of ocean energy resources. These issues present the challenge which the following policies attempt to address.

Objective

Balance optimal, cost-effective development of the State's ocean energy resources, as well as the State's other energy sources, with the preservation of Hawaii's coastal and marine environments.

Policy A

Actively encourage alternative ocean energy use as well as the development of integrated energy resources and the use of hydrogen as a medium of energy transfer, as an alternative to fossil fuel dependence.



Implementing Actions:

DBED should:

1. Support establishment of a commercial-scale OTEC plant at the earliest possible date.
2. Expand funding support to ocean energy research and development, including but not limited to OTEC, wave energy capture, marine biomass, and the exploration of ocean energy innovations.

Policy B

Conduct an inventory of Hawaii's ocean energy resources and the coastal and marine environments that their development affects.

Implementing Actions:

DBED, in cooperation with OSP, should:

1. Design a coastal and marine environmental database, in conjunction with other related agencies, to consolidate government, university, and private research, which would be updated continuously and publicly accessible.
2. Update ocean energy resource inventories completed to date, and expand them where necessary to include data on wave, tidal, marine biomass, salinity gradient, or other prospective energy resources.
3. Assess the relative degree of impact on the marine and coastal environment of the complete array of potential energy sources available for State use, in order to establish a cost/benefits matrix for public consideration.
4. Identify shore areas most at risk from potential oil spills, inventory their plant and animal life, and evaluate the magni-

tude of potential financial loss of both tangible and intangible resources in those areas at risk. [See Waste Management section.]

Policy C

Increase public knowledge regarding ocean energy technologies.

Implementing Actions:

DBED, in cooperation with DOE, should:

1. Solicit Federal and private-sector funds to expand its educational campaign on ocean energy resources for use in schools, including information on relevant ocean-related State and County programs.
 2. Develop informative, multimedia presentations for public dissemination on different ocean energy technologies.
- DBED should:*
3. Update financial and investment data on ocean energy technologies developed elsewhere, as background information for potential commercial ocean energy private-public partnerships.
 4. Research or model the costs of electricity production and potential co-products for all potential ocean energy sources.

Policy D

Mediate conflicts of use between ocean energy programs and other ocean uses, and compensate communities of interest when other uses are limited or curtailed by State-mandated ocean energy activities.

Implementing Actions:

DBED should:

1. Establish a program offering facili-

tated negotiation on ocean energy-related conflicts.

2. As a means to preempt potential conflicts, investigate innovative approaches to facilitate goal-setting within Hawaii's communities with regard to energy development and ocean management, such that agreed-upon goals could be incorporated into an ongoing ocean planning process.

3. Investigate means to compensate communities for loss of coastal and ocean use due to ocean energy developments, and to establish rates and kinds of compensation.

Policy E

Enhance coordination and cooperation among State, County, and Federal agencies responsible for permitting ocean energy activities, to reduce duplication of effort, simplify the permitting process and increase public involvement in ocean energy management.

Implementing Actions:

DBED, in cooperation with DLNR and DOT, should:

1. Develop means to increase the opportunities for public notification and review of proposed projects, including instituting a public hearing explaining the project and inviting comments at the time the application for permit is first filed.
2. Evaluate the Federal, State, and County regulatory regimes applicable to energy activities and suggest approaches to coordinating the permitting process.

J. MARINE MINERALS

Offshore Resources

Mineral deposits, ranging from sand to manganese crusts, are found in Hawaii's territorial sea and Exclusive Economic Zone (EEZ). Manganese crusts are found offshore in the EEZ adjacent to Hawaii. These hard mineral resources are also found near Johnston Island, 820 miles west-southwest of Hawaii. Crusts occur on sediment-free areas of the seabed and on the flanks of islands and seamounts at depths of 700 to 2,400 meters.

The crusts contain varying combinations and percentages of metals such as iron, manganese, cobalt, copper, nickel and platinum, with cobalt being the most economically valuable. Recent studies show crusts carrying up to \$350/ton of contained metals in place. The State is considering marine minerals development since it offers an opportunity to diversify Hawaii's heavy economic dependence on tourism. Studies estimate that mining and processing in the State could generate more than 3,000 new jobs and annual sales of about \$540 million. In addition, marine mining in Hawaii could offer the United States a

domestic source of important strategic materials.

Under the Outer Continental Shelf Lands Act (OCSLA), the Federal government claims sole authority over mineral mining activities on national seabeds outside State waters within the EEZ. Hawaii questions the applicability of the OCSLA to the resources off Hawaii. In addition, the OCSLA does not meet the needs of the marine minerals industry, nor are the U.S. territories, such as Johnston Island, included under its regulations. The coastal states have limited rights, with no



provision for revenue sharing or joint management. Hawaii's current role is restricted to policy issues relating to planning and reviewing offshore minerals activities through a cooperative agreement with the U.S. Department of the Interior (DOI).

Onshore/Nearshore Resources

While onshore sand deposits are found on all of the major islands except Hawaii, nearshore sand deposits are not as easily identified. Studies are underway to locate such resources. Sand is a valuable resource in Hawaii, for beach replenishment as well as the construction industry. Sand quality, color and grade determine the value and use of sand resources. Fine-quality sand is used exclusively for beach replenishment and is generally found onshore in relict sand dunes or offshore in several other types of deposits. Construction-quality sand is mainly derived from crushed basalt and lithified dunes. If mined, onshore sources of sand are expected to be depleted within ten years. Given the potential adverse impacts on beaches and coastal habitats, sand mining has been effectively banned onshore and nearshore since 1978.

Sand mining lies within waters under State jurisdiction. Both the Department of Land and Natural Resources (DLNR) and the Department of Transportation (DOT) share authority over submerged land leasing activities. County authorities primarily include the parks and recreation departments for beach replenishment and the planning departments (Department of Land Utilization (DLU) for the City & County of Honolulu)

under the Special Management Area (SMA) and Shoreline Setback provisions of Hawaii's Coastal Zone Management Program (CZM).

The major issues pertaining to both offshore and nearshore/onshore mineral resources involve jurisdictional and environmental concerns. Federal/State relations in the mining of manganese crusts need to be clarified, otherwise industry will be reluctant to develop marine mining within the EEZ around Hawaii. Furthermore, marine mining will not be acceptable to Hawaii residents until the potential environmental impacts of mining — manganese crusts or sand mining — are fully discussed and addressed.

Objective

Explore the establishment of a marine minerals industry which is economically beneficial, environmentally sound, and socially acceptable to the people of Hawaii.

Policy A

Assert the State's interest in a full partnership with the Federal government in managing marine minerals activities, including the equitable sharing of any revenues derived from the mining of manganese crusts.

Implementing Actions:

DBED, in cooperation with OSP, should:

1. Continue to encourage Hawaii's congressional delegation to amend the OCSLA or create new minerals legislation giving the State equitable revenue-sharing benefits from EEZ marine mining and leasing activities. Such legislation should grant coastal states a meaningful role in offshore

mining decision-making without compromising other interests of the State of Hawaii.

2. Continue to pursue full partnership with the Federal government by using the successful implementation of the Federal/State Joint Planning Arrangement as partial justification for joint management of Hawaii's EEZ.

Policy B

Encourage and support appropriate research activities that will help to determine what types of marine minerals industry can be established within Hawaii's EEZ without incurring unacceptable environmental or social costs.

Implementing Actions:

DBED, in cooperation with OSP, DLNR, DOH, UH and appropriate Federal agencies, should:

1. Provide for monitoring the environmental effects of offshore marine minerals development, mining and processing on marine biota and the ocean/atmospheric system by conducting studies of the ocean environment before, during and after the undertaking of these activities through the Federal/State Joint Planning Arrangement. Because of the newness of the technology and lack of comprehensive data regarding the environmental effects of such mining, consideration should be given to establishing an experimental industry/Federal/State mine site prior to embarking on large-scale development activities. Information gained from the experimental site should be used in developing a permanent regulatory regime.

DBED should:

2. Coordinate any onshore activities with DOT and other appropriate State and County agencies in anticipation of any infrastructure needs relating to processing or transshipment of marine minerals.

DLNR, in cooperation with UH and DOH, should:

3. Monitor the environmental effects of nearshore exploratory and sand recovery projects on marine biota by conducting studies on the ocean environment before, during and after the undertaking of these activities.

Policy C

Foster public awareness and facilitate informed public input regarding the development of marine minerals mining, processing and related efforts in the State.

Implementing Actions:

DBED should:

1. Ensure that the public is informed as to the efforts taken by the State to explore developing an offshore marine minerals industry and onshore support network.

DLNR should:

2. Follow a similar action to keep the public informed as to the efforts taken to address the potential development of nearshore sand recovery.

DBED and DLNR should:

3. Achieve these goals by providing informational materials and conducting public workshops.

Policy D

Promote appropriate environmentally sound and socially acceptable private-sector development in the area of marine mining, processing and related efforts in the State.

Implementing Actions:

DBED should:

1. Consider the use of economic and other incentives that would encourage exploration of an economically viable, environmentally sound, and socially acceptable marine minerals industry in Hawaii.

2. Review the State and Federal regulatory systems as they apply to offshore minerals mining to determine what, if any, unnecessary impediments exist to developing a viable industry.

Policy E

Establish local expertise in marine mining and make industry aware of Hawaii as a marine minerals center.

Implementing Actions:

DBED should:

1. Identify existing experts and help to develop new local expertise in offshore minerals and mining by running seminars on scientific findings and technology developments related to marine minerals.

2. Establish Hawaii as a center for coordination of marine minerals development in the Pacific and as a site for research and

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APPENDICES

APPENDIX I Background to the Planning Process

A. Immediate Concerns

The Council began work on the more immediate ocean management problems by combining issue lists contributed by individual members. In subsequent meetings the Council refined the master list of issues by referencing real cases. Council staff completed three case studies of areas in crisis to clarify issues. Two issues emerged as critical: (1) jurisdictional overlap among State agencies, and among County, State, and Federal activities; and (2) conflicts between public and private use of ocean resources.

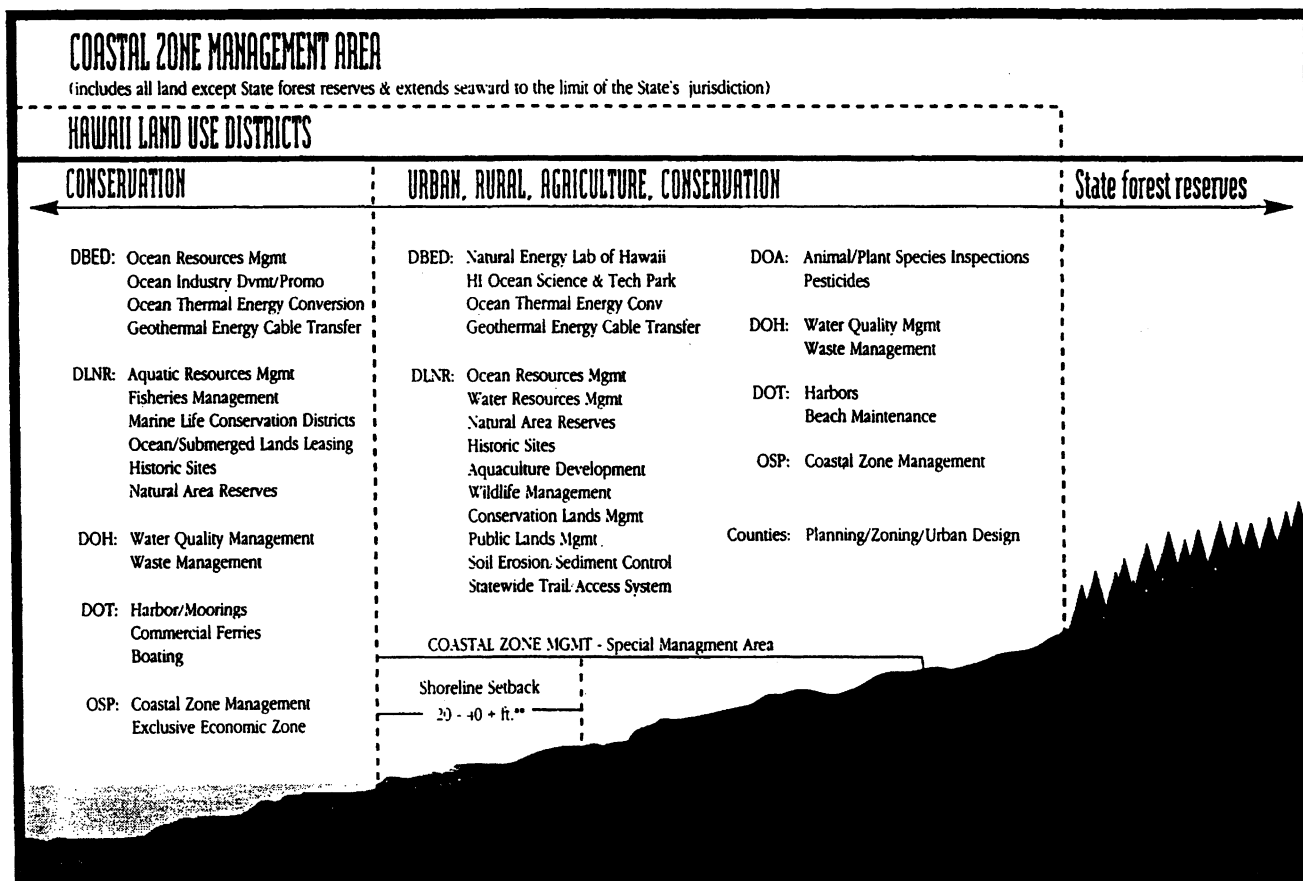
In response, the Council recommended three State actions: (1) transferring the Boating Branch from the Department of Transportation to the Department of Land and Natural Resources; (2) encouraging all ocean-related State agencies to establish carrying capacities and set limits of acceptable change for ocean resources; and (3) developing overall ocean management strategies allowing for fair and equitable use of Hawaii's ocean and coastal resources.

B. Long-Term Solutions

The second, more deliberate Council strategy defined the steps to developing an Ocean Resources Management Plan for the State of Hawaii. To establish an overview of the State's current ocean management structure, the Council requested staff to conduct a survey of all the State's ocean-related programs. Covering fiscal years 1989, 1990, and 1991, it requested information on staffing, programs in progress and funding sources. The survey also included reviews of existing State laws and agency rules, authorities and programs pertaining to ocean resources. Combined with Office of State Planning studies on State, Territorial Sea and Exclusive Economic Zone jurisdictions, results of the survey provide a comprehensive view of Hawaii's current ocean resources management and development regime. The results are published in a Technical Supplement.

APPENDIX II

Major Ocean and Coastal Responsibilities



* "Shoreline" means the upper reaches of the wash of the waves, other than storm and seismic waves, at high tide during the season of the year in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth or the upper limit of debris left by the wash of the waves (§205A-1).

**The several counties through rules adopted pursuant to Chapter 91 or ordinance may expand the shoreline area to include the area between mean sea level and the shoreline (§205A-45).

Federal		CZM	Coastal Zone Management Program (OSP)	MMTC	Marine Minerals Technology Center (UH)
COE	(Army) Corps of Engineers				
DOI	U.S. Department of the Interior	DAR	Division of Aquatic Resources (DLNR)	NARS	Natural Area Reserve System (DLNR)
EDA	Economic Development Administration	DB&F	Department of Budget and Finance	NELHA	Natural Energy Laboratory of Hawaii Authority (DBED)
EPA	Environmental Protection Agency	DBED	Department of Business, Economic Development and Tourism	ORB	Ocean Resources Branch (DBED)
FEMA	Federal Emergency Management Agency			OSP	Office of State Planning
FERC	Federal Energy Regulatory Commission	DLNR	Department of Land and Natural Resources	PUC	Public Utilities Commission
FWS	U.S. Fish and Wildlife Service	DOA	Department of Agriculture	SCORP	State (of Hawaii) Comprehensive Outdoor Recreation Plan
ITA	International Trade Administration	DOE	Department of Education	SG	Sea Grant College Program (UH)
NMFS	National Marine Fisheries Service	DOH	Department of Health	UH	University of Hawaii
		DOT	Department of Transportation	County	
NOAA	National Oceanic and Atmospheric Administration	FMA	Fishery Management Area (DLNR)	C&C	City and County
NPDES	National Pollution Discharge Elimination System	HAR	Hawaii Administrative Rules	DLU	Department of Land Utilization (City & County of Honolulu)
NPS	National Park Service	HCDA	Hawaii Community Development Authority (DBED)	SMA	Special Management Area
NSF	National Science Foundation	HEER	Hazard Evaluation and Emergency Response Office (DOH)	Other	
OCRM	Office of Coastal Resources Management	HIG	Hawaii Institute of Geophysics (UH)	EEZ	Exclusive Economic Zone
OCSLA	Outer Continental Shelf Lands Act	HIMB	Hawaii Institute of Marine Biology (UH)	EWCR/SI	East-West Center/Resource Systems Institute
PURPA	Public Utilities Regulatory Policies Act	HNEI	Hawaii Natural Energy Institute (UH)	FADs	Fish Aggregating Devices
USCG	U.S. Coast Guard	HOC	Hawaii Ocean Center	GIS	Geographic Information System
USDA	U.S. Department of Agriculture	HRS	Hawaii Revised Statutes	IUCN	Int'l. Union for Conservation of Nature and Natural Resources
USN	U.S. Navy	HTDC	High Technology Development Corporation (DBED)	JPA	Federal/State Joint Planning Arrangement
WESTPAC	Western Pacific Regional Fishery Management Council	HURL	Hawaii Undersea Research Laboratory (UH)	OTEC	Ocean Thermal Energy Conversion
SBA	Small Business Administration			PICHTR	Pacific International Center for High Technology Research
State		LUC	Land Use Commission	R&D	Research and Development
CDUA	Conservation District Use Application (DLNR)	MLCD	Marine Life Conservation District (DLNR)	TORCH	The Ocean Recreation Council of Hawaii

APPENDIX IV

Hawaii Ocean Programs — by Agency and Management Activity

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH/EDUCATION	FINANCING	REGULATORY
Ocean Recreation	COE; DOT Harbor Facilities		NPS Marine Areas Adjacent to Coastal National Parks	DLNR State Comprehensive Outdoor Recreation Plans		DLNR Aquatic Safety Intervention Project - Hanauma Bay	USCG National Recreational Boating Safety Account	NMFS Endangered Species Protection
	County - Parks and Recreation Facilities, Access and Service		FWS; DLNR Protected and Endangered Marine Species	DLNR Hawaii Statewide Trail and Access System		LH - Sea Grant	FWS Federal Aid in Sport Fish Restoration Account	NMFS; COE Offshore Mooring Permit
			DLNR State Parks, Recreation Areas and Activities, and Historic Sites				Center for Disease Control Honolulu Aquatic Safety Intervention Project - Hanauma	USCG; DOT Recreational and Boating Vessels
								DOT Boating Rules
								Shore and Shorewaters Permit
								Ocean Recreation Mgmt Areas
								Marine and Harbor Patrol Officers
								DOT; DLNR Ocean Leasing Permit
								DLNR Conservation District Use Application
								Recreational Fishing Rules
								Conservation & Resources Enforcement
								DOH Water Quality Monitoring
								County - Planning Depts Special Mgmt Area Use Permit
								Shoreline Setback Variance
Harbors	COE Commercial Harbors Construction and Maintenance			DOT Statewide Transportation Plan for Harbor Development			COE Commercial Harbors Construction and Maintenance	COE Commercial and Small Boat Harbor Construction
	DOT Harbor Facilities						USCG National Recreational Boating Safety Account	USCG; DOT Recreational and Boating Vessels
							FWS Federal Aid in Sport Fish	

APPENDIX IV

Hawaii Ocean Programs — by Agency and Management Activity (continued)

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH/EDUCATION	FINANCING	REGULATORY
Harbors (cont.)							DOT Commercial Harbors Special Fund (user fees) Small Boat Harbors and Launching Ramps Special Fund (user fees)	DOT Commercial and Small Boat Harbors, Launching Ramps Rules
Fisheries	DOT Harbor Dvmt	PACIFIC FISHERIES DVMT FOUNDATION Saltonstall-Kennedy Pgm DLNR Fish Aggregation Devices Deepwater Habitat Enhancement Artificial Habitat for Bottomfish Artificial Reef	NMFS WESTPAC Fishery Mgmt Plans DLNR Fish Toxicity Tests Mahi Culture Fishery Management Areas		DBED Fisheries Investment Promotion Seafood Promotions	ITA: NMFS Fisheries Export Mkt Information NMFS: DLNR Catch Statistics DLNR Automated Fisheries Information Main Hawaiian Island Resources Investigation UH-HIMB Pelagic & Reef Fish Behavior	PACIFIC FISHERIES DVMT FOUNDATION Saltonstall-Kennedy Pgm FWS Commercial Fisheries Research and Dvmt Act Federal Aid in Sport Fish Restoration Act DBED Fishing Boat Loan Programs	USCG: DOT Marine Safety NMFS: USCG FWS: DOT Enforcement DLNR Fishing Regulations Fishing Licenses & Permits Special Marine Animal/Product Possession and Sale License (specific species) Scientific Collecting Permit
Marine Ecosystem Protection			FWS National Wildlife Refuge OCRW National Estuarine Research Reserve NPS Marine Areas Adjacent to Coastal National Parks COE: EPA: FWS Anchialine Pools DLNR Marine Life Conservation Districts Fishery Management Areas Natural Area Reserves Seabird Sanctuaries			DLNR Seabird & Waterbird Surveys UH: FWS Cooperative Fisheries Research Unit UH-HIMB Marine Life & Reef Research	NMFS: FWS Endangered Species Protection USCG: DOT: DOH Oil & Chemical Spill Response DOH Water Quality Monitoring DLNR Conservation District Use Application Monitoring & Enforcement DOT Boating Rules Ocean Recreation Mgmt Areas County - Planning Depts Special Mgmt Area Permit Shoreline Setback Variance	

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH/EDUCATION	FINANCING	REGULATORY
Beaches and Coastal Erosion	COE Erosion-control Structures		FEMA National Flood Insurance Program DOT Beach Maintenance Programs Coastal Protection	DOT Beach Maintenance Programs Coastal Protection OSP		UH Ocean Engineering and Geophysics & Geology Departments		COE Permit for Activities in Navigable Waters Offshore Mooring Permit DLNR Conservation District Use Application Forest and Water Reserve Zones Rules DOT Shore and Shorewaters Permit DOH Water Quality Monitoring County - Planning Depts. Special Mgmt Area Use Permit Shoreline Setback Variance
Waste Management				USCG: DOH Hazard Evaluation and Emergency Response Petroleum Industry Response Organization Oil Spill Management Counties - Wastewater Advisory Committees Select Critical Wastewater Disposal Areas		DLNR: DOT: SG: Sea Life Park Marine Plastics Disposal Regulations UH Oil Spill Research		USCG Oil/Hazardous Material Response EPA Oil Hazardous Material Response (inland) COE Permit for Activities in Navigable Waters DOH Water Quality Monitoring NPDES Wastewater Treatment Systems Rules Hazardous Waste Permit Nonpoint Source Pollution Program DOT Pollution Control Rules Counties - Public Works Manage Wastewater Treatment Plants

APPENDIX IV

Hawaii Ocean Programs — by Agency and Management Activity (continued)

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH EDUCATION	FINANCING	REGULATORY
	<i>DLNR</i> Aquaculture Development Program	<i>DLNR</i> Aquaculture Development Program		<i>DLNR</i> Aquaculture Development Program	<i>USDA</i> Agriculture Marketing Svc	<i>USDA</i> Agricultural Library Svc	<i>USDA</i> Agricultural Marketing Svc	<i>COE</i> Permit for Activities in Navigable Waters
		<i>DLNR - DAR</i> Research and Development Activities			State Coop Extension Ofcs	<i>FWS; NMFS; EDA; UH-HLMB</i> Various Research and Dvmt Programs	Farmers Home Administration Loans	<i>DOI</i> Endangered Species Protection
		<i>NELHA</i> Aquaculture Research and Production			<i>DLNR</i> Aquaculture Development Program	<i>Center for Applied Aquaculture</i>	Federal Crop Insurance	<i>DOH</i> Water Quality Monitoring
						<i>Hawaii Aquaculture Advisory Council</i> Promote Communication Between State Agencies and Private Orgs	<i>NSF; SBA</i> Grant Funding	National Pollutant Discharge Elimination System
						<i>USDA</i> Agricultural Library Svc	<i>DOA</i> Aquaculture Revolving Loan Fund	Shellfish Regulation and Inspection
						<i>NELHA</i> Aquaculture Research and Production		<i>DLNR</i> Groundwater Allocation
						<i>DLNR</i> <i>Anuenue Fisheries Research Cntr.</i> Baitfish Research		Conservation District Use Application
						<i>DLNR - ADP</i> Research and Development Activities		Stream Diversion
						<i>UH-SG</i>		Historic Site Protection
						<i>UH-HLMB</i> <i>Mariculture Research and Training Cntr</i> Research and Training Facility		<i>DOA</i> Non-Indigenous Species Importation
						<i>Maui County</i> Baitfish Facility		<i>DOT</i> Shore and Shorewaters Permit
						<i>Molokai</i> Mariculture, Inc.		<i>County - Planning Depts</i> Special Mgmt Area Use Permit
						<i>Ohia</i> Shrimp Farm		Shoreline Setbacks
								<i>County - Public Works</i> Grading Permit
								<i>C&C Honolulu</i> Well Permit

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH EDUCATION	FINANCING	REGULATORY
Energy	HTDC Commercial High Tech Projects and Industrial Parks	DBED Energy Resources Coordinator Hawaii Deep Water Cable Project NELHA OTEC experiments Counties Alternative Energy Resource Development		DBED Energy Resources Coordinator		HNEI Alternative Energy Sources NELHA OTEC Research PICHTR High Technology Development UH-HIG Geothermal Program	PL 96-310 OTEC Research, Dvmt and Demonstration Act	COE Permit for Activities in Navigable Waters PURPA/FERC Price Markets and Price Levels DOI OCSLA Permit DLNR Conservation District Use Application Marine Life Conservation District Fishery Management Area Natural Area Reserves State Parks Public Lands DLNR, DOT Ocean and Submerged Lands Leasing DOT Shore and Shorewaters Permit DOH Water Quality Monitoring PUC Commercial Production and Sale of Electricity County - Planning Depts Special Management Area

APPENDIX IV

Hawaii Ocean Programs —by Agency and Management Activity (continued)

RESOURCE AREA	CONSTRUCTION	RESOURCE DEVELOPMENT	RESOURCE MANAGEMENT	PLANNING	MARKETING/PROMOTION	RESEARCH/EDUCATION	FINANCING	REGULATORY
Marine Minerals				DOI Minerals Policy and Program Dvmt DBED Joint Federal/State Manganese Crust Task Force Federal/State Joint Planning Arrangement		DOI/UH Marine Minerals Technology Center (MMTC), Ocean Basins Division and Center for Ocean Resources Technology UH-Look Laboratory UH - HIG, HURL SG: EWC/RSI DBED Various Research		DOI Mineral Mining Activities on the Outer Continental Shelf COE Harbor Activities

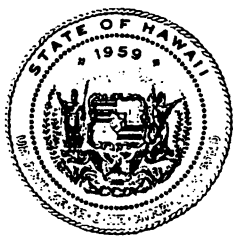
Governance Options Evaluation Criteria

A. Policy Integration—Insuring that State policy regarding management of ocean and coastal resources is consistent among the various programs and agencies, avoids functional duplication and programmatic gaps among agencies, and provides unified funding priorities.

B. Operational Coordination—Insuring that governmental management activities are coordinated, have the capacity for broad oversight in control of resource allocation, budget and clearinghouse functions, and are able to balance multiple competing interests.

C. Leadership—Insuring that State ocean governance has visibility, presence, solid authority and singular accountability, the capacity to analyze opportunities and effectively mobilize resources to realize them, resolve conflicts, and anticipate management issues and respond flexibly and appropriately.

D. Feasibility—Insuring that governance is practical and achievable, including political realities, likelihood of obtaining sufficient funding and expertise to implement, and the impact on current structures and programs.



P H O T O C R E D I T S

Hawaii Coastal Zone Management Program
Hawaii Foreign-Trade Zone, No. 9
Hawaii Undersea Research Laboratory
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1998 Review of the Hawaii Ocean Resources Management Plan

Report to the Twentieth Legislature
Regular Session of 1999



1998 REVIEW OF THE HAWAII OCEAN RESOURCES MANAGEMENT PLAN

Prepared for the
**Hawaii Coastal Zone Management Program
Office of Planning**

by

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Executive Summary

In 1990, the Ocean Resources Branch of the Department of Business, Economic Development and Tourism (DBEDT) initiated a process for improving the management of Hawaii's ocean resources. The planning process involved the preparation and review of ten technical reports, dozens of community meetings around the state, and close consultation with the Hawaii Ocean and Marine Resources Council. This group was formed to oversee the planning process. The resulting *Hawaii Ocean Resources Management Plan* (ORMP), completed in 1991, identified 66 proposed policies and 364 implementing actions for ten different sectors. In 1994, the plan was adopted by the legislature.

In 1997, the Ocean Resources Management Plan (ORMP) subcommittee of the Marine and Coastal Management Advisory Group (MACZMAG) requested a review of the status of management recommendations identified in the plan. This request was based, in part, on recognition of the state's declining fiscal resources and implications for resource management. The Hawaii Coastal Zone Management Program (CZM) within the state Office of Planning contracted with a university planning team associated with the Department of Urban and Regional Planning and the Social Science Research Institute to undertake the review. The review focused on three broad questions:

- To what extent have the ocean resource management recommendations identified in the 1991 *Ocean Resources Management Plan* been implemented?
- To what extent are the objectives and implementing actions contained in the plan still relevant to Hawaii's current ocean management issues?
- What new ocean management initiatives are perceived as needed to meet current and anticipated management challenges?

Much has changed in Hawaii in the seven years since the plan was developed. A decline in visitors and visitor expenditures, combined with reductions in federal spending, has contributed to a growing fiscal crisis affecting all government agencies. This fiscal crisis has reduced the funds and personnel available for resource management. It has also eroded some public support for resource management initiatives. As a result, the resource management agenda must necessarily be more focused and strategic.

The planning team conducted more than forty interviews with agency officials and ocean management specialists over a four-month period between April and July 1998. The expertise and knowledge of the interview participants was crucial in determining the current status of the Hawaii Ocean Resources Management Plan. The planning team appreciates the time that each participant took to share their mana'o, their thoughts and opinions, and their wisdom during the interviews and extensive editing of this report. On the basis of the insights gained during the process of report development, this document

summarizes findings pertaining to the Hawaii Ocean Resources Management Plan in 1998 and offers recommendations for improving ocean resources management in Hawaii.

This report has been organized into three sections. The first section reviews the history of the ORMP and provides a contextual backdrop for the findings and recommendations. The second section, arguably the most critical, summarizes general ocean management issues and recommendations identified in interviews, reports, and analysis. Seven general issues are identified:

- ❑ Lack of strategic planning;
- ❑ Inadequate enforcement;
- ❑ Lack of recognition of ecological and economic importance of ocean and coastal issues in Hawaii;
- ❑ Inadequate access to information about resource management activities;
- ❑ Outdated management regimes for ocean and coastal management;
- ❑ Inadequate management capabilities and lack of administrative efficiency;
- ❑ Inadequate administrative flexibility for resource managers.

The report identifies thirteen recommendations to address these general issues. The final section outlines sector-specific management issues corresponding to the recommended actions in the ORMP and presents twenty-nine sector-specific recommendations.

REVIEW OF THE OCEAN RESOURCES MANAGEMENT PLAN

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REVIEW OF THE HAWAII OCEAN RESOURCES MANAGEMENT PLAN

Findings and Recommendations

This document provides an assessment of the status of the ocean resource management activities identified in the 1991 *Hawaii State Ocean Resources Management Plan* (ORMP) for the Marine and Coastal Zone Management Advisory Group (MACZMAG). In preparing this report, we were asked to: (1) investigate the extent to which implementation of the plan has occurred; (2) assess the degree to which the objectives and implementing actions contained in the plan continue to be relevant; and, (3) provide recommendations to assist agencies in addressing current ocean resource management needs of Hawaii.

ORMP BACKGROUND

In 1988, the Hawaii State Legislature passed the Ocean Resources Management Act, which mandated the preparation of a comprehensive framework for managing ocean and coastal resources. A planning team consisting of the Hawaii Ocean and Marine Resources Council staff and planning consultants undertook an intensive seven month process in which critical issues were identified. They prepared technical papers on ocean research and education, ocean recreation, harbors, fisheries, marine ecosystems, beaches and coastal erosion, waste management, aquaculture, energy, and marine minerals. The planning team also identified policy options and made recommendations.

Issue identification and evaluation of policy options involved extensive consultation with community and user groups, ocean experts, and others. The planning team prepared a draft *Hawaii Ocean Resources Management Plan* which included a statement of major challenges facing the state, a description of guiding principles to be adopted, recommendations for governance options with a more integrated approach to ocean management, and sector summaries. After public review and comment, the Council published the *Hawaii Ocean Resources Management Plan* in 1991.

The legislature did not act on the ORMP in 1991. However, the Office of State Planning established the Coastal and Ocean Management Plan Advisory Group (COMPAG) in 1992 to promote implementation of the ORMP. COMPAG consisted of representatives from agencies with responsibility for managing ocean and coastal resources and non-governmental representatives with concerns about ocean and coastal resources. Under their mandate, COMPAG could execute the ORMP to the extent possible without legislative authority. COMPAG, however, functioned largely as a forum for discussing the most pressing ocean and coastal resource management problems.

COMPAG did not have the authority to persuade agencies to comply with recommendations, but it did provide a coordinating mechanism for management and helped to develop momentum among a coastal and ocean resources constituency. Several attempts were made to poll agencies on the degree to which they had implemented sector-specific recommendations in the ORMP. The dedication of COMPAG members, and the support from the Office of State Planning (which was located in the Governor's Office), resulted in the adoption of the plan by the Hawaii State Legislature in 1994. Legislation to enact the plan, Act 104, passed in 1995.

Act 104 designated the Hawaii Coastal Zone Management program within the Office of State Planning as the lead agency for implementing the plan. This office has since been renamed the "Office of Planning," and relocated to the Department of Business, Economic Development, and Tourism (DBEDT). Act 104 also established the Marine and Coastal Zone Management Advisory Group (MACZMAG), consisting of representatives from the state and county agencies and non-governmental members. The mandate of MACZMAG is to facilitate the implementation of the ORMP and to coordinate efforts to solve coastal and ocean management problems. MACZMAG serves as a forum for discussing coastal zone management and ocean policy issues.

During the four years since formal adoption of the ORMP, many of the dozens of resource management activities identified in the plan have been initiated, but many others have not. With this in mind, the Ocean Resource Management Plan (ORMP) subcommittee of the MACZMAG initiated a review of the plan and its degree of success. Numerous ocean-related issues have emerged over the past seven years, and new programs have been created to address these issues. Many of the programs meet objectives specified in the ORMP; however, the question remains as to the ORMP's influence over what has occurred. Members of the MACZMAG are seeking an assessment of the current relevance of the ORMP.

METHODOLOGY AND SCOPE OF REPORT

This report builds on previous studies of the implementation of the ORMP conducted by the Ocean Resources Branch, DBEDT. In 1996-1997, a survey listing the numerous recommended ocean resource management policies and actions was distributed to each of the state and county agencies with ocean management authority. Administrators from each designated agency reviewed the policies, prioritized each implementing action (high, medium, or low), and assigned a status (ongoing, planned/budgeted, planned/not budgeted, not considered). That report provided baseline information for development of the current assessment.

The 1998 project team decided that intensive personal interviews would be the most appropriate method to elicit explicit information about the priority and status of sector-specific recommendations in the ORMP and to identify new ocean and coastal resources management needs that have emerged since 1991. The interviews explored reasons for priority and status designation, and the degree to which the actions have been accomplished. The interviews also provided an opportunity to identify perceived pressing ocean management problems and actions to mitigate their impact from people in this state most informed about these issues. The interviews were designed to identify the status of resource management activities in each of the

ten ORMP sectors. Division administrators or their designees were interviewed. In addition to agency interviews, the team discussed the ORMP with people attending the Marine and Coastal Zone Management Advisory Group (MACZMAG) meetings, those with ocean-related occupations, and those in frequent contact with the coastal and ocean agencies. In all, over forty interviews were conducted.

The interview format followed a consistent structure, but policy questions were tailored for each agency. The interviews lasted no less than one hour and usually no more than three hours. The interviews were conducted in person or by telephone. In the initial part of the interview, interviewees described their agency or division's general mission and their perceived relationship to the ORMP. Interviewees reviewed the policy priorities and status from DBEDT's 1996 study, and discussed any related issues to the implementing actions. In several instances, the implementing action had already been accomplished, or was no longer relevant because of administrative or legislative changes.

The interviews concluded with several general questions, which asked about the most important ocean resource management issues and the means to address these problems. Interview participants also listed the most significant developments affecting their agency's management abilities in the last five years. These responses have been incorporated into the section called, "Significant Changes in the State of Hawaii," and into the sector specific recommendations. The interviewees were asked to consider their relationship with the CZM program and with MACZMAG, and to make recommendations that would improve coordinating activities. The final question which the interview participants considered was their success (or lack of success) and the specific reasons for this.

REACTION TO THE ORMP

One of the goals of this review was to assess the continuing relevance of the ORMP. Generally, it appears that most of the ocean resource management activities identified in the plan have been implemented or are considered ongoing activities. Almost no implementing action received a designation of "not considered," which is a significant improvement from the 1996-1997 assessment. Moreover, the principles of ocean management on which the plan is based are widely accepted, although not necessarily attributed to the influence of the plan.

A majority of the interviewees had previously read sections of the ORMP, and a number were involved in meetings that led to its development. The ORMP is widely recognized among managers and those interested in ocean resources as a well-written document. It encompasses a diverse range of important concepts associated with ocean management. The ORMP goes one step beyond many general plans by identifying policies (66) and implementing actions (364) for ten resource sectors and by designating agency responsibility (16) for each action. While recognizing the ORMP as a sound document, few managers use it as an explicit guide or reference.

The most common criticism is that the ORMP no longer reflects current political and economic realities. Declining government revenues, changes in government priorities and programs, and

declining support for resource management have undermined specific actions identified in the plan. Critics argue that the ORMP provided a useful menu of ocean resource management initiatives, but that the context of management has shifted dramatically. What is now needed, some argue, is a much more strategic approach to ocean resources management. This approach should focus on a few key issues and priorities that can be addressed with limited funds and less management personnel.

There was broad agreement among those interviewed that one of the most significant successes of the ORMP and the development of the MACZMAG has been the improvement in the quality of debate about ocean and coastal issues. The ORMP offered a useful synthesis of the management issues in ten ocean and coastal sectors and suggested specific initiatives. MACZMAG has provided a forum to continue discussion of these issues and to suggest new approaches to dealing with them. The ORMP became the catalyst for important discussions about water quality, enforcement, bottom fishing, the whale sanctuary, integrated watershed approaches to management, beach and coastal erosion, and non-point source pollution.

A number of ocean resource management initiatives have occurred since the development of the ORMP, which accomplish many of implementing actions and policies contained in the plan. The successes achieved through these initiatives may not have been driven by the plan; however, the planning process, where these policies were discussed extensively, may have inspired individuals to pursue the objectives of the ORMP without actually referencing the document. (Refer to the timeline of Ocean Management Activities). Managers recognize that successes in ocean resources management activities have been the result of dedicated, hard-working staff and individuals. The years of planning, discussions, and labor in preparing the ORMP and subsequent legislation may have contributed to the dedication to improving management of ocean and coastal resources.

SIGNIFICANT CHANGES IN THE STATE OF HAWAII

Since the development of the ORMP, a number of changes have occurred in the State of Hawaii which have had a significant impact on the ability of the agencies to function and to meet policy objectives described in the ORMP. The following list describes the changes:

- The new government administration in 1994 brought about changes in leadership within administrative agencies. Some of these new administrators contributed to the current agency objectives and goals, and to the priorities of the agencies.
- A state budget crisis beginning in 1994 resulted in reduction in force of state workers, especially in critical resource management programs, and an early retirement program, which enabled a few junior staff to receive promotions. These two changes counterbalanced each other, although some knowledgeable and experienced staff members shifted to new areas of their agencies, and some expertise was lost. In general, the changes from budget cuts and the reduction in force policies resulted in decreased morale among state workers and among public workers, which persists with the depressed economy.

- Decreases in federal spending in the State of Hawaii have resulted in redirection of funds for management into new areas. The Government's Performance and Results Act of 1992 has resulted in increased efficiency among some of the federal agencies in Hawaii. One example of this is provided by the United States Coast Guard Marine Safety Division, which uses a business plan to reach their objectives rather than regulatory directives, and this has significantly improved their efficiency in responding to mitigation and in interacting among the boating community.
- The decline in the number of visitors and tourism revenues has reduced pressure on the state's natural resources to some small degree. Although this is the ideal time for planning for the use and protection of these natural resources, less funding is available in the state for such efforts.
- Native Hawaiian issues have become increasingly integrated into resource management, particularly because of the State of Hawaii Supreme Court opinion in Public Access Shoreline Hawaii v. Hawaii County Planning Commission (known as the PASH decision) regarding resource gathering rights and deliberation regarding the Waiahole Ditch water rights issues. Management has become more complex because ocean resources are linked to cultural rights.
- The Kaho'olawe Island Reserve has been established as the largest actively managed reserve in the State of Hawaii. The ocean area under Kaho'olawe Island Reserve Commission (KIRC) jurisdiction is approximately 90 square miles and the land area is 45 square miles. A visionary Kaho'olawe Ocean Resource Management Plan (KOMP) has been adopted by KIRC. This plan blends scientific and Native Hawaiian cultural approaches to restore and manage the resources of the Reserve. The KOMP addresses several issues including unexploded ordnance safety, resource sustainability, public access, defining subsistence use, proactively addressing PASH issues, harvest controls, and other resource issues.
- Resource management successes have occurred at the community level, and the state agencies have learned to rely on and value the expertise of community people. Increased reliance on communities and volunteers to provide resource management capability has been one coping strategy by agencies to deal with the state's budget crisis. Examples of this include the Na Ala Hele volunteer program for trail maintenance, the Adopt-a-Harbor program in the state's recreational harbors, and in fisheries management inventories.
- Among public agencies, the private sector, non-governmental organizations, and the local communities, there has been increased recognition that marine resource issues cross boundaries, both physical and administrative. This has led to consideration of integrated resource management and the development of public-private partnerships. Examples of this include: the West Maui and Ala Wai watershed management programs; the joint effort by DOH and the CZM program to implement a Non-Point Pollution Control Plan; the coordinated efforts among UH, DLNR, and the Counties to develop effective beach erosion mitigation measures; partnerships for clean-up activities, such as the "Get the Drift and Bag It" effort; and, the Day Use Mooring Program which teamed the diving industry, small boat owners and recreational boat operators, a non-governmental organization, UH researchers, and several agencies to obtain permits and install buoys.

- Increased awareness and understanding of physical processes in the environment has occurred. Examples include studies of coral reef ecosystems, beach and coastal erosion, and non-point source pollution.

OVERARCHING ISSUES AND RECOMMENDATIONS

A number of general issues emerged as a result of this review. In this section, we outline these issues and describe any current initiatives and efforts that attempt to address these issues in some way. Finally, we offer recommendations to the Office of Planning and to MACZMAG for consideration.

1) Issue: Lack of Strategic, Long Range Planning

The ORMP articulated a vision of ocean resources management and an outline for its realization. However, the plan and attempts to implement it have not resulted in a shared commitment among resource management agencies, resource users, and the general public. The ORMP has not built the kind of constituency required to realize such a vision in the current fiscal and political climate. The State needs to adopt a vision and a set of strategic initiatives based on the clear recognition that ocean resources provide the economic and ecological base of an island's survival.

Recommendation 1: Develop a 2010 Hawaii Oceans Strategic Initiative

Convene a conference to identify key initiatives for management and use of coastal and ocean resources in the 21st century. Priorities should be determined for allocation of financial resources and lead agencies should be designated for implementing actions requiring multiple agency cooperation. It may be appropriate to reconvene the ocean resource management plan working groups for each sector to identify key initiatives.

In convening a planning process, it will be crucial to include high-level government officials, such as the Governor and key legislators, private sector interests, and a wide representation of community groups to develop a workable long-term strategic initiative.

Recommendation 2: Develop a Vision and Goals for the Hawaii CZM Program and MACZMAG

The Hawaii Coastal Zone Management Program (CZM) is critical to coastal and ocean resources management. The fiscal crisis combined with numerous ocean resource management issues requires focused, long-term planning. Achievable objectives should be determined which are clearly understood by the staff and by the public. For the CZM program to act as an effective agency, they must foster support from the public at large.

1. Establish a Futures Visioning and Strategic Planning process that will evolve as needs change for the program. This process and the plan should identify goals, address specific objectives, and develop priorities for effectively and efficiently meeting these management objectives. The planning process should correlate with the 2010 Hawaii

Oceans Strategic Initiative developed in the first recommendation, but it should be more focused on the CZM program

2. The CZM program must be empowered to provide stronger leadership. The CZM Program and counties should work together to ensure that the counties meet federally determined standards for continued funding. County planners should issue periodic reports, which explicitly demonstrate that their programs meet coastal zone management criteria.
3. Develop a coastal and ocean resources constituency by publicizing CZM participation and coordination of activities, inviting media participation, publishing a newsletter, and disseminating information on CZM and the ORMP on the internet. An interactive web site with an assigned data manager should be developed.

The Marine and Coastal Zone Management Advisory Group (MACZMAG) needs a focused visioning and strategic planning workshop or retreat. The objectives determined at these sessions should be followed through with actions.

1. Establish a Futures Visioning and Strategic Planning process that will evolve. Determine priorities and coordinate efforts.
2. Monthly MACZMAG meetings will build momentum for coastal management. Each meeting should focus on one particular focal issue. For example, convene a single meeting on Nonpoint Pollution with three or four experts addressing particular areas, such as siltation and nutrient loading. The experts should discuss the ideas prior to the meeting and deliver an integrated message, which will enable MACZMAG to have an informed discussion, pass a resolution, and possibly influence legislative priorities.
3. MACZMAG members should receive high-level support (possibly from the Governor) for work on Subcommittee Issues. (Example: A letter encouraging supervisors to allow members to devote 4 hours/week to work on the subcommittee issues.)
4. Meetings should occur at various field sites to witness problems and inform members.
5. Invite media participation in MACZMAG.
6. Invite participation from legislators.

2) Issue: Inadequate Enforcement

Inadequate enforcement, identified in the ORMP as a major problem and also identified by many administrators in the course of this review, occurs for several definable reasons:

- 1) Insufficient personnel and equipment for patrol and monitoring. This has typically occurred with the budget crisis and the reduction in force.
- 2) Inability to Fulfill Agency Responsibilities and the Lack of Public Awareness. When agencies fail to educate the public about their rules, do not install appropriate signage and warning mechanisms, or have outdated, unclear rules, the agencies impede the ability of enforcement personnel to carry out their jobs. Many public agencies no longer have the staff and budget to dedicate to fulfilling these responsibilities.

- 3) **Complexity of Existing Rules and Regulation.** Many state and county regulations are complex, which makes them difficult to enforce. They are sometimes unintelligible to the average citizen. Areas in which they are supposed to be enforced (marine life conservation districts or commercial ocean recreation zones) are not always clearly delineated. Resource management and protection rules have often been written in a piecemeal fashion and little effort has been made to revise and integrate regulation governing specific resources.
- 4) **Inadequate Compliance Mechanisms and Severity of Penalties.** Existing statutes impose criminal penalties rather than civil penalties for numerous resource abuses, and resource violations for overharvesting are then thrown out of court because the courts are overburdened with severe criminal cases. Penalties are not of a sufficient degree of severity to significantly deter violators.
- 5) **Lack of Voluntary Compliance.** Voluntary compliance depends on knowledge of the law and willingness to obey. If the public has not received appropriate education and if the laws have not been created, people cannot voluntarily comply with laws and regulations.

Recommendation 1: Increase funding for enforcement personnel and equipment, and provide for improved public awareness, through new sources of revenue, such as user fees and fees derived from fines and civil penalties.

Recommendation 2: Revise existing Statutes to impose civil penalties rather than criminal penalties, and review and increase the severity of penalties as deemed most effective in deterring violations. This will simplify enforcement and increase compliance with laws. Use of civil penalties could increase revenues necessary to fund additional enforcement personnel, if statutes permit enforcement agencies to retain a percentage of the fines..

Recommendation 3: Review, evaluate, revise and develop laws and regulations affecting resource management. Develop appropriate laws that are consistent, logical and easy to understand. Review and revise existing regulations to ensure that they are simple, clear, and enforceable. This will improve voluntary compliance

Recommendation 4: Brief the judiciary system regarding the long-term consequences of resource violations. Better inform the courts of the complex causes and effects of violations and work with them to impose fines reflecting the violations' true severity.

3) Issue: Lack of Recognition of Ecological and Economic Importance of Ocean and Coastal Resources for Hawaii

In an island ecosystem, in which the ocean is an integral component, the current policies and visions of leadership reflect an inattention to the interconnectedness of Hawaii's ecology and economy. For example, the funding for Department of Land and Natural Resources is less than one percent of the state's budget, and yet, DLNR has management responsibility for one quarter of the state's land, including critical watershed areas, forests, coastal, and nearshore waters. Maintaining resources is crucial to sustainability and it is critical to deriving economic benefit from resources for tourism, fishing, boating, and importing goods from ships. More cognizance of the connection between the ocean resources and the state's economy is needed, especially at a time where "economic revitalization" is a goal for the state.

Recommendation 1: Develop Natural Resource Accounting methods and use these concepts to communicate resource importance.

Methods of valuing natural resources have been developed in other parts of the world and have been used to allocate funds for resource management. Some efforts are now underway to apply these natural resource accounting methods in Hawaii, in an effort by the Secretariat for Conservation Biology and the University of Hawaii Economic Research Organization (UHERO) and the Social Science Research Institute (SSRI). These efforts should be expanded. Results of these alternative methods of valuing the natural resources should be made understandable and available to managers, government leaders, and the public in decision-making. Explanation of values in terms of extended cost-benefit analyses, opportunity costs, and willingness to pay for resources will enhance the ability of managers to justify protection or use of resources. The natural resource accounting results should be used to communicate the importance of protecting the state's natural resources for the long-term social and economic benefit of local residents.

Recommendation 2: Develop initiatives and strategies promoting an understanding of the economic importance of careful resource management and development.

Many state agencies have staff who understand the connections between ensuring the health of the state's ecology and the state's economy. The state should develop initiatives that focus on sustainable management and development, and prevention of future economic losses. Examples include: beach erosion mitigation efforts, hazard mitigation planning, oil spill prevention and mitigation, protection of native vegetation and forests, protection of coral reef ecosystems, planning to improve economic revenues to the state from projected increases in cruise ship visits, support of alternative, renewable, local energy resources and intermodal transportation systems, and the promotion of ocean and ecotourism, as well as other beneficial ocean industries such as seafood and ocean research and development.

4) *Issue:* Inadequate Access to Information about Resource Management and Development Activities

Lack of adequate information sharing about the status of Hawaii's ocean and coastal resources and about resource management and development efforts occurs in a variety of areas: between state and county agencies, between multiple agencies tasked with one aspect of resource management, among internal divisions of single agency, between the public and private sector, and between the public sector and local communities. Among government agencies, misinformation and poor communication may lead to duplicative management efforts or to a lack of needed attention. Inadequate information can also increase jurisdictional conflicts and resentment, which impede management activities. The lack of information provided to the general public about ocean and coastal resources and management efforts result in a lack of understanding of the opportunities for future use and of the threats to resources. It further diminishes community participation needed to strengthen the coastal and ocean resource management and development efforts.

Recommendation 1: Develop mechanisms to improve information sharing.

Improving information sharing and dissemination would enhance management and development capabilities and it would build public and private support needed for appropriate resource management.

Option 1. Establish a Coastal Resource Database Repository by creating a NOAA Coastal Services Center at the University of Hawaii to build upon the research products of the UH Coastal Geology Group headed by Dr. Charles Fletcher, which currently has the capability to manage large amounts of data gathered in multiple formats. This office interacts with the CZM program frequently, and would be a logical place to store data, since infrastructure and technical skills are available. Their workstations can standardize formats for resource management agencies and the public. Software enables them to manipulate photographs, map erosion rate data, produce the data in many formats, and make the data available over the Internet. The non-governmental members of MACZMAG have recommended this option. Database management would require one full-time technician who could provide both digital and outreach skills.

Option 2. Develop a Database of Ocean Resource Management Activities - A database accessible from most agencies and other interested organizations would enable managers to easily gain access to information about projects and responsibilities of other agencies. It would improve the ability of managers to address critical ocean management problems with appropriate contacts in state and county agencies. The information would enable managers to meet the objectives of the ORMP to provide a comprehensive, integrated approach to management. It would retain the "institutional memory" lost with shifts in personnel and staffing and provide a baseline for future management evaluations. The Office of Planning's Geographic Information Systems Program is an appropriate agency to house and manage the database.

Several types of information could be incorporated into a Comprehensive ORMP database and several of these databases have already been developed that could be incorporated into a comprehensive information system. Some examples include:

1. The Main Hawaiian Islands Marine Resources Inventory (MHIMRI) database on fish species, fecundity, biomass estimates, etc, for five regions: Kaneohe Bay, the Kona Coast, Hilo, Hanalei, and West Maui. Data is in the form of Dbase3 and ArcInfo for Geographic Information (GIS) systems.
2. An extensive database for boating accidents and oil spill incidents and sites is available from the United States Coast Guard.
3. An extensive and growing database on coastal erosion rates, remote sensing of coastal and nearshore environments, including reefs, and historical shoreline change patterns is available from the UH Coastal Geology Group in CD-ROM, Photomaps, and at their website < http://www.soest.hawaii.edu/coasts/cgg_main.html>.
4. The Division of Conservation and Resource Enforcement has developed a database of sites where violations have occurred. Violations have been categorized. This information could easily be digitized and used in a GIS format.
5. The Coral Reef Initiative monitoring program is currently developing databases of activities and scientific information in regard to coral reef ecosystems. It will be available for use in GIS systems.
6. Information and data from the reviews of the ORMP and activities can be incorporated into a networking database.
7. With funding from CZM Section 309, UH researchers, Drs. Davianna McGregor and Jon Matsuoka, are preparing a database of existing cultural resources and documentation, which should be completed in 1999. This project was developed to provide more information and clarification about cultural resources discussed in the PASH decision. The next phase of this could be to digitize spatially related resources.
8. The Oahu Resource Conservation and Development district project is collecting a comprehensive list of existing resource databases and digitized information, which could serve as a good resource for state, county, and other interested groups.

Option 3. Improve the Ocean Resource Management Plan Web Page – A web page providing a brief overview of the ORMP is currently available within the DBEDT Internet Site. More specific information could be included. The web page can be changed periodically to reflect updates and progress in ocean resource management, including the posting of minutes from MACZMAG meetings by CZM staff. Minimal effort would be required to make extensive use of currently available information and to disseminate it broadly.

The ORMP Web Page should be linked to the previously described databases, which will enable users accessing the website to run searches and queries in ocean resource management activities. Two examples of websites with database links, which should be linked to an ORMP site, include:

1. The United States Coast Guard, District 14 Marine Safety Office in Honolulu, has an interactive web site < <http://www.aloha.net/~msohonono/>>. They have the capability to research marine-related questions and to provide results in about one day. They are also recording the degree of use and cataloguing frequently asked questions.

2. The Coral Reef Initiative website. This website has the capability of storing data and information about coral reef management efforts, monitoring activities, and ongoing research efforts.
3. The Office of Environmental Quality Control (OEQC) in the Department of Health website < <http://www.hawaii.gov/health/oeqc/eioeqc00.htm>>.
4. The Energy, Resources and Technology web site < <http://www.hawaii.gov/dbedt/ert> > has extensive information on ocean and energy resources and programs, as well as links to industry partners statewide.

Option 4. Build on the Coastal Zone Management Program newsletter currently being developed to provide information on the status of coastal resources and ocean resource management activities. As a networked program, all resource management agencies have responsibility for implementation of the state's coastal zone management act. The program should take advantage of information available from other participating agencies.

Option 5. The news media has shown increasing interest in natural resource management problems. Examples of media involvement include: Gary Sprinkle's educational segments, coordinated by DLNR's coordinating Group on Alien Species and funded by Alexander & Baldwin and private interests, have focused on the brown tree snake and miconia. Additional media attention in the last year has provided information on the National Humpback Whale Sanctuary and the Hawaii Coral Reef Initiative. The local television and radio stations will frequently publicize local events on resource education, such as the annual "Get the Drift and Bag It" campaign. The information compiled for the previous three options could be made available to newspapers and radio, television, and cable stations.

Recommendation 2: Support applied research efforts

Inadequate information and dissemination of misinformation may be linked to the lack of communication between researchers and managers about technical and scientific findings. By supporting applied research projects linked to management and development, the managers, who must make decisions about levels of resource use, will be able to make more informed decisions and justify those decisions to the legislature and the general public. Information sharing improves the quality of management. Some examples of applied research projects being conducted by the University of Hawaii with various public agencies include: beach erosion processes and mitigation research; coral reef monitoring and research on threats to coral reef ecosystems; water reclamation methods and treatment; marine minerals harvesting research; marine mammal protection needs based on studies of biology, water quality effects, and strandings; and, monitoring of fish stocks and habitats. Information from these studies should be broadly disseminated, and included in the previously recommended database, web page site, and newsletter.

5) Issue: Outdated Management Regimes for Ocean and Coastal Management

There is a general recognition that the separation between land and ocean/coastal management has seriously hampered the state's ability to manage its ocean and coastal resources. In 1991, the ORMP recognized this problem in its overall recommendations. However, no substantive changes in the approach to land and coastal resource management have occurred. The ORMP recommended the implementation of a regional planning approach, which would embody concepts of integrated resources management and would recognize linkages among marine, coastal, and terrestrial environments. A new approach could build on the ORMP and policy guidance by the 1988 Legislature for sustainable development and could incorporate concepts such as limits to acceptable change. Conceptually, integrated resource management has been adopted, but the horizontal structure of management and overlapping jurisdictions complicate integrated management planning.

Recommendation: Coordinate Existing Efforts in a Pilot Project for Integrated Resource Management

Coordination of resource management initiatives currently underway may provide opportunities for improving regional planning. The development of a pilot project that focuses on combining management efforts and collaborating among agencies and communities in several critical areas would address the recommendations for integrated planning in the ORMP. The concept of ahupua'a management should be used within the integrated resource management framework. This pilot project would provide a different perspective and advance integrated efforts further than previous projects, which focused solely on efforts in a particular geographic area, such as the North Shore Kauai Project and the Kaneohe Bay Master Plan.

Impetus and guidance for a pilot project emerges from the positive results of several federal and community initiatives:

- 1) The Environmental Protection Agency (EPA) has promoted a watershed approach to management through its Office of Wetlands, Oceans, and Watersheds (OWOW), and several local groups have received grants for watershed planning, such as the Ala Wai Watershed plans and the West Maui Watershed Plan.
- 2) The Oahu Resource Conservation and Development Council (ORC&D) is preparing a community opportunities assessment in districts defined by ecological relationships from the mountains to the sea (a similar idea to the ahupua'a).
- 3) The Ahupua'a Action Alliance has been actively working with watershed planning groups to integrate the concept of ahupua'a management into their efforts.
- 4) Communities have coordinated regional development plans with county planning agencies, such as the Koolaupoko Development Plan, the Waialua Development Plan, and the North Shore Development Plan. Additional regional, integrated plans within Hawaii include the West Maui Watershed Plan, the Kona Regional Council for coastal and marine resources management, and the Kaneohe Bay Master Plan.

The Kaneohe Bay Master Plan, the Kaneohe Bay Regional Council, and the West Maui Watershed Plans have been in place for several years now. The Kailua Bay Advisory Council is currently identifying sources of land-based marine pollution and will be developing projects to reduce the impact of polluted runoff on streams and bay waters. Participants in several watershed planning efforts have expressed interest in developing a working relationship with agencies responsible for coastal water quality and coastal and ocean resource management

The University of Hawaii and the Division of Aquatic Resources in the Department of Land and Natural Resources are about to initiate a Coral Reef Assessment and Monitoring Project. They will also coordinate several problem-oriented research projects aimed at improving the management of coral reef ecosystems. The Department of Health is currently involved in several programs to improve coastal water quality, including the implementation of the Nonpoint Pollution Control Program with the Hawaii Coastal Zone Management Program. A concerted effort to bring one or more of the watershed management efforts together with the Hawaii Coral Reef Initiative Research Program and the Department of Health could provide the kind of integrated regional planning and management effort envisioned in the ORMP.

By building on the momentum of any of these projects, it will be possible to implement a pilot project for integrated resource management with far-reaching application throughout the state. Such a project would entail considerable coordination. It may be possible to use an existing management structure, such as the Kaneohe Bay Regional Council, to establish the necessary coordination.

6) *Issue:* Lack of Resources and Legal Support for Administrative and Management Capabilities

The lack of financial resources and dispersed responsibilities for management have contributed to inefficient and ineffective management. Management needs to be organized, follow determined goals, and be coordinated among various agencies to be efficient. The managers need financial and legal support to meet goals and to fulfill their responsibilities.

Recommendation 1: Develop Strategic Plans

State agencies should follow the lead of Federal public sector agencies, such as the Marine Safety Branch of the United States Coast Guard, as part of the Government's Performance and Results Act of 1992. Each agency should develop these internal plans to clarify and determine their goals, objectives and priorities within their budgets. This will increase overall efficiency through a planning process rather than through the reduction of personnel.

Recommendation 2: Develop Alternative Funding Mechanisms

Following the lead of a majority of coastal states, mechanisms should be in place to generate revenues for effective resource management by charging users of the resources, based on the

resource management funding needs. One positive example has been Hanauma Bay parking fees and donations from non-residents to improve management capability of the park.

Another recommendation, frequently cited in interviews for this review, was in development of Recreational Fishing Licenses. Small fees for recreational fishing would provide revenues that could be used to monitor fish stocks and enforce catch restrictions for recreational fishing. Temporary licenses for higher fees could be charged to non-residents who come to Hawaii for recreational fishing. Examples: Alaska, Great Lake States, California, Florida, etc.

Recommendation 3: Improve Long-Term Planning for Infrastructure Needs

One example of this need is improved infrastructure in ports and harbors to support cruise ships and leisure vessels. However, port development is only one example where the lack of overall planning and coordination has failed to maximize opportunities for the state. This is only one of numerous resource management areas that demands long-term strategic planning. (It is cited because it was addressed several times in interviews.)

In the 1998 legislative session, a bill was adopted to establish a commission to facilitate the development of the Hawaii Maritime Authority (HMA). The Governor ultimately supported this act. The purpose of HMA is to centralize planning, management, and development of maritime and waterfront activities. The commission will examine the complexities involved in establishing HMA and make recommendations to the 1999 state legislature. With this in mind, the Hawaii Maritime Authority may ultimately address the issue of port infrastructure development. Improving the capability for Hawaii to attract revenue from activities that are already occurring is a matter of strategic planning. Cruise ship visits to Hawaii have increased nearly 200% in 1997, and DBEDT's projections show continued increase. Transportation and support infrastructure, as well as a long-term management strategy, needs to be developed with the agencies and stakeholders, including the Department of Transportation, the City & County Department of Transportation Services, the Department of Land and Natural Resources, the Department of Business, Economic Development, and Tourism, and other private and public interests.

7) Issue: Need for Administrative Flexibility for Resource Managers

Extensive legislative involvement in resource management inhibits effective management by administrative agencies. Effective management is inhibited in two ways. First, tight legislative control limits administrative flexibility and timely management action. Management authority is currently lodged in both statutes and administrative rules. However, the legislature has sometimes maintained control over both policy issues governing the types of resource management strategies to be employed and administrative details over how policies are to be implemented. With regard to fisheries, for example, details such as minimum sizes for taking of some species are set in law rather by administrative rule. The special fund established for mitigating oil spills is another familiar example. Legislative approval is required for expenditure of funds. Funds have not been spent on an array of

mitigation activities for which they were generated, and the tax on oil, which feeds this fund, will expire if the fund reaches its cap.

Many of the details of resource management involve issues of scientific or technical uncertainty, such as rates of species loss or impacts of proposed ocean or coastal uses. With its already heavy agenda and limited schedule, the legislature is not an ideal setting for organizing analysis, developing technical studies, and for deliberating technical management issues.

In these cases and others like them, the legislature becomes the venue for routine resource management decisions. Administrators, resources users, and the general public spend hundreds of hours lobbying for or against statutory changes that might be more efficiently resolved in administrative hearings.

Recommendation: Vest Management Authority in Agencies

The Hawaii State Legislature should vest more resource management authority in executive branch agencies and allow them to manage resources through the rulemaking provisions of the Hawaii Revised Statutes (Chapter 91). Agencies would gain the ability to meet changing resource needs more efficiently and effectively. The legislature would maintain policy oversight authority for agency actions and appropriations. It would monitor spending through such mechanisms as an annual audit and spending justifications.

SECTOR SPECIFIC STATUS AND RECOMMENDED ACTIONS

In light of the changes occurring globally and, more specifically, in Hawaii's economic and political climate, sector-specific goals and recommendations from the designated implementing agencies have changed since the ORMP was written. In some instances the previous goals have been accomplished. Innovative ideas and concepts in ocean management resource areas have emerged, but these concepts do not yet have a place in the ORMP.

This section of the report provides a brief overview of the sector-specific policies and their current status within the departmental objectives for the agencies reviewed. All of the specific interview responses for each implementing action appear in the appendix. In each sector, managers highlighted specific activities and accomplishment since the ORMP was written and they described continuing needs. These are included in the following discussion of the sector-specific areas included in the ORMP.

As the interview participants responded to the status and priority of each implementing action, they also offered suggestions that would improve management within their areas of responsibility. These actions emerged as ways to reach the overall policy objectives and respond to the current context for management. Some of these actions had been included in some form in the ORMP, and need to be reemphasized. Some of these recommendations are new ideas based on the experiences of the managers and their staffs who work within these sectors on a daily basis.

Ocean Research and Education

The ocean research and education objectives in the ORMP are to develop a supportive state management system that encourages and promotes marine education, fosters growth, continued economic viability, and effectiveness of ocean research and development in Hawaii (ORMP, p.16). Given this objective, the agencies identified to implement actions in this sector include the Department of Education, the University of Hawaii, the Ocean Resources Branch (ORB), DBEDT, the private sector, and several divisions in DLNR.

Formal ocean education and public awareness affect all of the ocean management sectors within the ORMP. Adequate and relevant research must be undertaken to address management issues. As knowledge increases, the research should improve management capability and the recommended actions in the ORMP should be adaptive to new information. Funding levels of education and awareness activities should reflect its overall importance.

Important changes and continuing needs within this sector have been identified as follows:

- The Hawaii Trade Program no longer exists; however, its functions are being served minimally through other sources, such as the ORB, the Hawaii Directory of Ocean Research and Development Organizations, the Hawaii Directory of Seafood Exporters, and the University of Hawaii School of Ocean, Earth Sciences, and Technology (SOEST) World's Fair Lisbon student recruiting effort.

- There has been an increase in resource use conflicts for marine protected areas. This has led to some research focused on addressing resource accessibility needs and limits to acceptable change.
- Involvement of Hawaiians and local communities has increased their participation and contribution in management of parks and interpretive centers.
- The US Coast Guard has developed community education programs for boaters and fishing vessels. They have also investigated marine safety problems and prepared several action plans to respond to problems. One practical method they use for educating boaters in safety includes distribution of a "Damage Control Kit" to boaters and instructing them on the use of its contents to prevent sinking. The kits contain a quick reference sheet, hose clamps, wedges, wood plugs, and patches. The kits cost \$5.30---far less than the cost of a USCG rescue operation.
- As a result of the PASH decision, the Office of Planning and the Department of Land and Natural Resources have organized study groups and research projects to increase understanding, education, and awareness of Hawaiian resource management issues and to develop mechanisms for conflict resolution.

In the area of ocean research and education, the available funding does not match the perceived importance and high priority status for many implementing actions. Education, appropriate research, and public awareness affect the recommendations made throughout this document. The discrepancies between status and funding should be examined and justified. Alternative funding sources should be explored.

ACTION 1: ESTABLISH AN OCEAN EDUCATION CURRICULUM FOR THE STATE. In order for effective ocean education to be fostered in the long-term, coordination needs to be enhanced between DBEDT, DLNR, DOH and DOE. Furthermore, DOE requires funding and staff. There is too little recognition of the value of ocean industries and resources and of the need to integrate education on these subjects into the public education system. Ocean education must be coordinated with the standard curriculum to provide accountability for student's learning in coordination with Goals 2000, a federal initiative focusing on outcome-based education.

ACTION 2: DEVELOP THE COASTAL GEOLOGY RESEARCH PROGRAM AT THE UNIVERSITY OF HAWAII. Currently one faculty member serves as the coastal geologist for the UH system. The Coastal Geology Group in SOEST draws in significant funding for UH (over \$3 million since 1992; a 7:1 ratio of grant income to salary) and the research results have been used extensively by state and county coastal managers. The program needs an additional coastal geologist and a coastal engineer. The benefit to state and county managers and the dramatic financial benefits to UH should justify the minimal funding needed to enlarge this program. Also, graduate student training provides a source of professional expertise to the coastal technical communities, both in government and in the commercial sector.

Ocean Recreation

The objective for this sector in the ORMP is to promote the development of safe ocean recreation opportunities, which are socially and environmentally acceptable and compatible with other ocean and coastal resource uses and available to all residents (ORMP, p.18). The agencies identified to implement actions in this sector include the DLNR's Division of Forestry and Wildlife, Division of Conservation and Resources Enforcement, State Parks Division, Division of Boating and Ocean Recreation; DBEDT's Ocean Resources Branch and Office of Planning; and, the Counties.

Important changes and continuing needs within this sector have been identified as follows:

- Volunteer involvement has become a key component of providing recreational activities, including beach and park clean-ups, Adopt-a-Park/Bay/Beach programs, and trail clearing for Na Ala Hele.
- The Ala Kahakai coastal trail on the Kona Coast of the Big Island was nominated for a National Historic Trail designation in 1998. The trail links ahupua'a, management districts, multiple landowners, and a variety of uses along the coastline, and required a cooperative effort of these various stakeholders to develop a plan for nominating the trail for national distinction.
- The Division of Boating and Ocean Recreation has moved from DOT Harbors to DLNR since the ORMP was written. It may be relocated again, based on the development of the Hawaii Maritime Authority, and the extent to which DOBOR is incorporated into it.
- The development of several databases related to ocean recreation needs has occurred in several state and county agencies involved in management of various ocean recreation opportunities. The City & County of Honolulu has developed an extensive database for the C&C Park Index, with over 400 entries, which has been included in the GIS database. The County of Maui has developed a database for public access and rights-of-way. The State has not fully developed its park database, and needs information on resources, current care, and time series data. DOCARE's database of violations and enforcement sites should be networked with other resource information. Most of this information is not linked accessibly in ways that facilitate information sharing.
- The Main Hawaiian Islands Marine Resources Inventory (MHIMRI), in the Division of Aquatic Resources at DLNR, developed a database on fish species, fecundity, biomass estimates, etc, for five regions: Kaneohe Bay, the Kona Coast, Hilo, Hanalei, and West Maui. Data is in the form of Dbase3 and ArcInfo for Geographic Information (GIS) systems. The MHIMRI also developed and implemented creel surveys. The bathymetric contours and survey information has been included in GIS, and the MHIMRI program is editing the layers and ground-truthing their information. This information supports community subsistence and recreational fishing activities.
- State Parks have used County personnel, lifeguards, in their beach parks. The State agreed to accept liability for activities occurring on State land in the 1998 legislative session, which removes liability from the County for their employees working in State Parks. This increases cooperation between the State and Counties and improves efficiency in the use of trained personnel.

- The City & County of Honolulu Parks Division formed a Prisoner Program in 1995 for cleaning and maintaining park areas. The program was so successful that the State developed a similar program to clean highways in 1997.
- C&C Parks Division will also be responsible for about 550 acres of land in the Barber's Point area to develop as athletic fields, campgrounds, and parks.
- Maui County developed a *Shoreline Access Guide* in 1994 as well as a Shoreline Access Management Plan. Maui has also developed a County Bikeways Access Plan, which includes shoreline routes.
- Facilities, such as visitor centers, restrooms, camping grounds, and parking lots, for recreational activities have become outdated. They were planned for fewer per site visitors and need extensive improvements.
- The UH Sea Grant and the C&C of Honolulu, Dept of Parks and Recreation have developed a four year study of limits to acceptable change for Hanauma Bay. This is the first site where limits to acceptable change analysis have been explored in Hawaii and it has implications for other resource areas. DLNR has reviewed other areas for protected status, such as Marine Life Conservation Districts (MLCDs).
- The dive industry has shown tremendous growth, almost 100%, since 1990. Maintaining reef areas for diving would support this growing industry. The DBEDT Ocean Resources Branch is working with the DLNR and the DOT to develop a program of underwater attractions using derelict vessels as alternative dive sites to disperse diving activities to areas of low utilization.
- The Day-Use Mooring Program is a positive example of public-private partnerships in Hawaii. Permits have been received and several installations have occurred since the ORMP was finalized.

ACTION 1: IMPROVE DATABASES FOR MANAGERS. Databases for ocean recreational uses (several of these listed in previous bullets) should be linked and more fully developed to provide managers with up-to-the-minute information.

ACTION 2: UPDATE RECREATIONAL FACILITIES. Facilities for recreational activities and tourism should be adequate to support the visitor infrastructure. For heavily frequented sites, the government should explore the possibilities of engaging private sector tourism operators in partnerships for improvements.

ACTION 3: IMPLEMENT RECREATIONAL FISHING LICENSE FEES. Models for obtaining small fees and licenses for recreational fishing to improve management and infrastructure for fishing (e.g., boat ramps, harbor facilities, etc.) can be found in almost all other states. The licenses would also enable managers to track the population of recreational fishermen, and to plan better in meeting their needs.

Commercial Harbors

The objective for this sector in the ORMP is to develop and maintain the State's commercial harbor system in order to meet both the needs of commercial users, and foreign and domestic commerce; and ensure that significant environmental and social impacts will be mitigated (ORMP, p.21). This network of commercial harbors provides the infrastructure for the shipments of essential commodities upon which our island State is so dependent---food, clothing, building materials, cars, fuels, etc. The DOT Harbors Division has the primary responsibility for the maintenance and development of the State's commercial harbors, and mitigates the environmental and social impacts of such development. Other agencies responsible for implementing actions in this sector include DBEDT's Ocean Resources Branch and Office of Planning, the Department of Health's Clean Water Branch, and the Counties.

Important changes and continuing needs within this sector have been identified as follows:

- DOT Harbors Division recently completed the Oahu 2020 Master Plan and Hawaii Commercial Harbors 2020 Master Plan. Future master plans for Kahului Harbor, Kaunakakai Harbor, Nawiliwili Harbor and Port Allen will address the 2025 horizon.
- Hawaii's isolated location increases the importance of developing the capacity to repair cargo ships and other large vessels. The demand for repair services continues to grow and this provides an opportunity for industry development. It will improve the ability to capture economic opportunities from visiting and locally-based vessels. DOT's Oahu Commercial Harbors 2020 Master Plan recommends a joint shipyard site at Barber's Point Deep Craft Harbor. The DOT is currently analyzing the feasibility of pursuing this project.
- The growth of Hawaii's population and economy requires an accompanying growth and development of its commercial harbors. Otherwise, Hawaii's shippers will be faced with increased difficulties, resulting in operational inefficiencies and higher costs of commodities. The increase in cruise ship projections (200% in 1997) also supports the development of commercial harbors to meet these needs.
- Increased need for intermodal transportation linkages, such as an intra-island, commuter ferry system, may prove viable in addressing the island's transportation needs.

ACTION 1: IMPROVE "ZONING" OR DESIGNATION OF HARBOR ACTIVITIES. To meet the projected demand for harbor use by cargo ships, passenger vessels, and commercial fishing boats, areas of use should be more logically zoned. A land-use suitability analysis is required. Agencies stressed the need for specific facilities to meet cruise ship needs, such as locations near tourist sites and easy access to downtown or Waikiki transportation. Cargo ships, passenger vessels, and commercial fishing boats compete for limited berthing and landside facilities. To some extent the Hawaii Maritime Authority and the DOT's master plans will address this problem; however, the designation of appropriate space for these vessels and their essential operations must be more carefully analyzed and supported.

Small Boat Harbors

The objective for the sector is to develop and maintain the State's small boat harbor system in order to meet the needs of recreational and small commercial vessel users in ways that ensure that significant environmental and social impacts will be mitigated and local carrying capacities will not be exceeded (ORMP, p.22). Given this objective, the agencies identified to implement actions in this sector include DBEDT's Ocean Resources Branch and Office of Planning and DLNR's Division of Boating and Ocean Recreation.

Important changes and continuing needs within this sector have been identified as follows:

- DOBOR's role in boating, as well as the responsibility of other agencies, may change as the Hawaii Maritime Authority is developed. DOBOR is targeted to be integrated into HMA, including regulatory powers, ocean recreation programs, and boating facilities.
- Enforcement responsibility for DOBOR's program has moved several times since the ORMP was written. A Marine Patrol, for small harbors, was moved into the Department of Public Safety, and then to the Division of Conservation and Resources Enforcement, DLNR. DOBOR has the regulatory authority, but not on-the-ground enforcement capability, which is currently handled by DOCARE.
- The private sector (Koolina, Ewa Marina) has been required to develop launch ramps for public use as a condition of State permits.
- Communities and agencies have established 12 Adopt-a-Harbor and Adopt-a-Ramp programs.
- A Marine Training Center has been established on Sand Island.
- Local opposition and environmental concerns limit the ability to expedite development and expansion of boat slips and boating facilities.
- Small boat harbors are becoming increasingly popular as ports-of-call for large passenger vessels. Some facilities are inadequate to accommodate the increasing numbers of passengers debarking from the ships. Expanded facilities need to be considered if continued use of these small boat harbor facilities is to continue.
- In 1993, the draft report for State Planning and Marina Guidelines was completed. It has not been adopted.

ACTION 1: DOBOR SHOULD REMAIN INTACT. To maintain consistency and to keep regulatory authority, DOBOR needs to remain intact as a program, which works closely with DOCARE on enforcement regulations. Currently, both divisions are located in DLNR, and this makes communication and consistency on enforcement of recreational resource activities easier to communicate. Should DOBOR move back into DOT, or should some of its functions be moved into the Hawaii Maritime Authority, it would not be as effective as currently considered.

Fisheries

The objective for this sector in the ORMP is to provide a foundation for an integrated State fisheries management system that ensures: 1) depleted and overexploited stocks will be restored to sustainable levels; 2) fisheries resources will be harvested at their optimum sustainable yield; and, 3) user conflicts will be minimized (ORMP, p.24). The agencies identified to implement actions in this sector include DLNR's Division of Aquatic Resources, Division of Boating and Ocean Recreation, and the Division of Conservation and Resources Enforcement; DBEDT's Ocean Resources Branch; the Western Pacific Regional Fishery Management Council; the National Marine Fisheries Service; the US Fish and Wildlife Service; and, the United States Coast Guard.

Important changes and continuing needs within this sector have been identified as follows:

- Information needs for fishing include: recreational fishing catch reports (or statewide creel surveys); a more comprehensive the Native Hawaiian Fishing Rights study with follow-up action by state government to recognize these rights formally and define how they would be addressed; a summary of problem areas which are experiencing a variety of recreational and commercial user conflicts, and conflicting gear interaction; stock assessment studies for most of the states' inshore and offshore fisheries; research on *taape* as an export to replace declining bottomfish stocks; new opportunities and long-range plans for trade and investment promotion; the development of cost-effective methods of stocking nearshore areas with culture species; the effects of artificial reefs on opakapaka, and other species; and, public education on the impacts of overfishing, how to catch and prepare underutilized species, and how to protect overexploited species.
- The MHIMRI program in the Division of Aquatic Resources of DLNR has developed creel survey methodology for nearshore fisheries, which collects data on catch and effort by gear type as part of a monitoring program in certain areas.
- For the past eight years, NMFS, the USCG, UH Sea Grant, private organizations and the State (MHIMRI in DAR/DLNR) have participated in collaborative fisheries research for the assessment, monitoring, and management of nearshore and inshore stockbuilding in MHIMRI areas.
- The Division of Aquatic Resources in DLNR has assembled a Bottomfish Task Force and Bottomfish Management Areas have been established in the Main Hawaiian Islands. A Gillnet Task Force has been established to address critical inshore fisheries management issues with the cooperation of federal and state agencies and private interests.
- The plans for the Seafood Fishing Village at Pier 17 are underway.
- The State (DOCARE), NMFS Enforcement, and the USCG have developed a Memorandum of Understanding as a cooperative agreement for enforcement of fishing regulations.
- The State's criminal penalties for marine resource violations inhibit effective management and enforcement of marine resource protection laws due to their greater burden of proof demands and lower fee schedule for fines. Civil penalties have been recommended as a more effective means of enforcing laws and prosecuting violations, but issuing civil penalties requires a change in legislation.
- NMFS and WESTPAC completed a report on Essential Fish Habitat areas for the state.

ACTION 1: MOVE FISHERIES-RELATED STATUTES INTO ADMINISTRATIVE RULES. To effectively manage fisheries resources, the Division of Aquatic Resources, DLNR needs to have greater administrative authority. This will enable them to limit entry to overexploited fisheries, to have greater flexibility in keeping fisheries management rules current and in reflecting changes in stocks, and to change rules based on new scientific information.

ACTION 2: IMPOSE CIVIL PENALTIES RATHER THAN CRIMINAL PENALTIES FOR RESOURCE VIOLATIONS. The current status of fisheries violations under criminal statutes does not foster compliance, because it makes violations more difficult to enforce and cases receive less stringent penalties compared to other violent criminal court cases. If civil penalties were pursued through stiffer fines and confiscation of equipment, voluntary compliance would be more likely. If the fines and equipment recovery values are set aside in a special fund, they could be used to support enforcement for resources.

ACTION 3: DEVELOP ALTERNATIVES TO REDUCE GILLNET USE. A Gillnet Task Force is currently investigating alternatives and incentive programs to minimize use of gillnets which have caused harm to marine mammal resources, fisheries, and coral reef habitats. The recommendations and alternatives of this task force should be disseminated to the public through an awareness program and implemented with community support.

ACTION 4: INSTITUTE RECREATIONAL FISHING LICENSES. Models for obtaining small fees and licenses for recreational fishing to improve management and infrastructure for fishing, e.g., enabling managers to better track the needs of recreational fishers and building and maintaining fishing piers. These licensing systems are in existence in almost all other states. The licenses would enable managers to identify the population of recreational fishermen, and to plan better in meeting their needs.

Marine Ecosystem Protection

The objective for this sector in the ORMP is to provide for protection of marine and coastal ecosystems, and establish a comprehensive system of marine and coastal protected areas within an integrated program which protects, preserves and enhances marine species and areas of exceptional resource value on each main island, representing each of the natural ecosystems and resources found in the marine and coastal environment of the State (ORMP, p.27). The agencies identified to implement actions in this sector include DLNR's Division of Aquatic Resources, Division of Conservation and Resources Enforcement, and Division of Forestry and Wildlife; DBEDT's Ocean Resources Branch and the Office of Planning; DOH's Clean Water Branch and Environmental Planning Division; the National Marine Fisheries Service; the US Fish and Wildlife Service; the Western Pacific Regional Fishery Management Council; the United States Coast Guard, and the Counties.

Important changes and continuing needs within this sector have been identified as follows:

- The MHIMRI Geographic Inventory for marine ecosystems was completed in 1992. It provides an inventory and database for use in marine ecosystem management for five areas throughout the main Hawaiian Islands.

- The statewide Day-Use Mooring program provides significant protection for reefs and fish habitat.
- Human interaction with marine mammals has increased, but most people do not understand proper and appropriate behavior in interacting with these species. Out of ignorance, people often harass sea turtles, dolphins, whales, or monk seals. Public awareness should be improved.
- In 1997, the Department of Land and Natural Resources identified "hot spot" areas for resources and management issues, which they frequently confronted. These areas have been assigned high priority designations for management. A report on Hot Spot Management areas has also been developed.
- The US Islands Coral Reef Initiative was developed in October 1997. The focus was on updating the previous initiative and developing viable projects for improving coral reef ecosystems. The US Congress has appropriated funding for coral reef research which responds to monitoring and management needs.

ACTION 1: PROVIDE PUBLIC OUTREACH AND EDUCATIONAL PROGRAMS FOR MARINE ECOSYSTEMS. Some of these programs and curriculum have already been developed by the Division of Aquatic Resources in DLNR and by various agencies interviewed. Even though there is coordination with the Department of Education, funding for the printing of curriculum resources must be obtained. This action relates to the first action listed in the ocean research and education section.

ACTION 2: LINK INFORMATION FROM MHIMRI WITH OTHER DATABASES AND GIS SYSTEMS. The MHIMRI program has gathered marine ecosystem data and continues to develop surveys for additional data collection. This information should be compiled with other resource data and held at one or two accessible locations, such as UH and DLNR, for the convenience of sharing information with the management community in a reliable network which regularly reviews and updates its information.

ACTION 3: CONTINUE TO DEVELOP COMMUNITY MONITORING PROGRAMS. The MHIMRI program has developed networks with local fishermen in five large areas throughout the State who can report on changes and status of their fisheries. Kauai has implemented a community monitoring and awareness program for monk seals. Additional efforts by volunteers who can link with staff members from state agencies will improve protection capability for marine resources.

Beaches and Coastal Erosion

The objective for this sector in the ORMP is to develop an integrated State erosion management system that ensures: 1) the preservation of sandy beaches and public access to and along the shoreline and 2) the protection of public and private property from flood hazards and wave damage (ORMP, p.30). Given these objectives, the agencies identified to implement actions in this sector include DLNR's Land Division; the Counties; and, the University of Hawaii.

Important changes and continuing needs within this sector have been identified as follows:

- The Erosion Conference hosted by the UH Sea Grant and the County of Maui in 1998 provided a good blend of science and management with multiple stakeholder participants. It advanced discussions and planning for beach management.
- The Coastal Erosion Management Plan (COEMAP) was developed through the collaboration of the Department of Land and Natural Resources and the University of Hawaii Coastal Geology Group as an evolving, organic document. The Board of Land and Natural Resources has adopted COEMAP. It provides a menu of beach management options and encourages ongoing input from the public. Public education has been encouraged through 15 meetings with Neighborhood Boards on Oahu and a series of interagency meetings for information sharing.
- The Coastal Geology Group at UH produced erosion rate maps for beach segments on Oahu in 1996 for CZM. UH Sea Grant Extension in Maui, the UH Coastal Geology Group, and Maui County are developing erosion rate maps for Maui which employ more statistical analysis and methodology.
- Maui County Planning Department and the UH Sea Grant Extension Service developed the *Beach Management Plan for Maui*, December 1997. The plan includes over 20 pages of objectives and recommendations for the management of Maui's shoreline areas.
- The Office of Environmental Quality Control (OEQC) developed environmental assessment guidelines for shoreline alteration activities, including seawalls in 1996.

ACTION 1: EMPOWER AND FUND THE DLNR COASTAL LANDS PROGRAM. With sufficient support, the newly established Coastal Lands Program (CLP) of the DLNR has the potential promises to develop new policies and plans needed to implement appropriate erosion control and beach management measures, sponsor research necessary to support the implementation of these policies and programs and network with state, county, and federal agencies and the broader public.

ACTION 2: PASS NEW LEGISLATION TO CREATE A SPECIAL BEACH IMPROVEMENT FUND. This fund would enable the Coastal Lands Program, in the Land Management Division of DLNR to receive funding specifically for alternative erosion management measures and beach restoration projects.

ACTION 3: ADOPT THE COASTAL EROSION MANAGEMENT PLAN (COEMAP). The newly revised and broadened COEMAP should be adopted by all CZM program agencies and authorities, such as DBEDT, DOH, and the Counties so that there is a consistent state-wide approach to the erosion problem.

ACTION 4: STREAMLINE THE PERMIT PROCESS FOR BEACH AND DUNE RESTORATION. The MACZMAG erosion subcommittee is discussing options for streamlining permitting. This would facilitate beach and dune restoration efforts, which is considered the most appropriate alternative for managing beach erosion at this time. Restoration should not be done at risk to other resources.

ACTION 5: DEVELOP A REGIONAL NODE OF THE NOAA COASTAL SERVICES CENTER IN SOEST WITH THE UH COASTAL GEOLOGY GROUP. Work with the NOAA CSC in South Carolina to develop a services center for island-focused research. Use local expertise to develop a scientific framework for management in island coastal environments. Use GIS-based, digital technology to develop scientific criteria for management decisions.

ACTION 6: IMPROVE DATABASE DEVELOPMENT AND INFORMATION SHARING. Historical erosion rates and changes from aerial photographs can now be digitally linked to databases and GIS systems. Working with UH Coastal Geology Group could improve the quality of information which managers can use for decision-making.

ACTION 7: DEVELOP AN INTEGRATED STATE EROSION MANAGEMENT SYSTEM. There have been several efforts at erosion management on a small-scale community basis and within counties, but there needs to be more comprehensive, integrated policy development for management. The MACZMAG subcommittee on erosion is a good forum for developing and continuing a multi-agency effort at addressing erosion management issues. Integrate erosion mitigation with resource protection and reduction of hazard exposure.

ACTION 8: DEVELOP A LOCAL CHAPTER OF THE AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION. Establish a cross-sectional group of coastal stakeholders to lobby the legislature for important beach management legislation. Hawaii could learn from previous mistakes on the mainland, and develop an effective beach nourishment program.

Waste Management

The objective for this sector in the ORMP is to ensure that the State is capable of effectively regulating waste disposal, and accidental oil and chemical spills, while protecting human health and minimizing environmental degradation (ORMP, p.32). Given this objective, the agencies identified to implement actions in this sector include DOH's Environmental Planning Division, the Clean Water Branch, the Hazardous Evaluation and Emergency Response Branch, the Solid Waste Management Branch, and the Wastewater Branch; the Counties; and, the United States Coast Guard.

Important changes and continuing needs within this sector have been identified as follows:

- DOH and the CZM program are coordinating the Nonpoint Source Pollution Control Program through a joint effort. This program also networks with community watershed and ahupua'a management efforts.
- The budget decreases for DOH have been significant. Without external funding from federal programs, DOH would not currently be able to meet critical environmental response needs for the state, including oil spill prevention, solid waste disposal, and hazardous waste removal.
- State On-Scene Coordinators were appointed in 1993, and one is located in each county. These positions are funded from the Pollution Revolving Fund, which was established from oil taxes. This program is severely understaffed and could benefit from additional SOSC positions. The State is about to reach its cap on this revolving fund which will eliminate the

tax. These funds can be used to expand the state's capability to respond to oil spill prevention and other pollution mitigation needs.

- The US Coast Guard provides response to ocean-related oil spills. USCG coordinates their program with DOH, the Hawaiian Operation Safety Team (HOST) and volunteers in the Area Committees. Industry also provides funding to mitigate potential oil spill threats through the Clean Island Council.
- The State and the USCG have funded an Air Deployment System (ADS) system. The state provides the chemical dispersant through a \$1.25 million expenditure of the revolving fund. The USCG provides the air transport on its C1-30s and trained crews for response to the oil spills.
- In 1993, the state developed guidelines for the use of reclaimed water. The Clean Water Act provided sludge regulations. Projections for the year 2000 are for the use of 25% reclaimed water and 25% reclaimed sludge.
- Hazard Evaluation and Emergency Response (HEER) in DOH is currently preparing a Risk Assessment Preparedness Report that identifies worst-case scenarios, most-probable scenarios, and mitigation needs from oil and hazardous wastes.
- A Statewide Operations Training Center on Sand Island has been established to improve local capability for wastewater treatment and disposal. Funding is provided through a cooperative effort among the four Counties and DOH.
- In 1994, Act 202 established the Clean Hawaii Center, which is an economic development center for recycling. The State has encouraged entrepreneurship and the development of products made from recycled wastes. Some examples include building materials made from plastics, glassphalt, and oil collection boxes. Effort in developing uses for recycled products is still needed.
- DOH adopted an Integrated Solid Waste Management Plan in 1991. This is currently being updated to address issues of source reduction, waste diversion, water reclamation, use of sewage sludge, composting, and reduction of individual oil wastes in water disposal systems.

ACTION 1: IMPROVE STATE'S CAPABILITIES TO RESPOND TO OIL HAZARDS.

Although the state has a number of committed agencies and personnel committed to oil hazard response, the state does not have the capability to respond to ocean hazards and continues to rely completely on the USCG for mobilizing response to ocean-related hazards. Hawaii has been less financially committed to mitigating oil hazards than other coastal states. There has been a good cooperative effort from the private and public side, but the state and county agencies need better equipment and more personnel for hazard response.

ACTION 2: DEVELOP A LONG-TERM COMMITMENT TO USE ORGANIC MATERIALS IN AGRICULTURE.

Using organic materials, such as food wastes and compost, for fertilizers and pesticides would decrease operation costs for farming, improve the quality of agricultural products, increase yields, and reduce pesticides in groundwater and nitrates in the soil. It would reduce these chemicals in runoff into marine ecosystems.

ACTION 3: INCREASE COMPOSTING OF GREEN WASTES. By increasing composting of green wastes, less space is needed in landfills and the compost has positive benefits for agricultural production. Facilities and equipment are needed for storing and composting waste collected from homes and for chipping wood. These wastes could be provided to communities for

gardening and landscaping. One example of such an effort is the chipping of Christmas trees and the use of the chipped wood for fertilizing trees in Kapiolani Park by the City & County of Honolulu.

ACTION 4: REQUIRE COMMERCIAL BUILDINGS TO RECYCLE. Commercial buildings produce large amounts of waste, but the offices in these buildings are not required to recycle their waste products. Recycling requirements for white paper, glass, and aluminum, as well as computer and printer cartridges, reduces the amount of solid waste, decreases the landfill space needed, and has less impact on the island environment. Tax incentives could be offered to businesses that comply by developing central areas for collection and by requiring compliance.

Aquaculture

The objective for this sector in the ORMP is to develop an integrated approach to manage the impacts associated with an expanded aquaculture industry in Hawaii, while maintaining the viability and integrity of the environment (ORMP, p.35). Given this objective, the agency identified to implement actions in this sector was DLNR's Aquaculture Development Program, which is being incorporated into the Department of Agriculture.

Important changes and continuing needs within this sector have been identified as follows:

- The Aquaculture Development Program, DLNR has been moved to the Department of Agriculture with the 1998 Legislative Session.
- The 1993 strategic plan for the program incorporated concepts of sustainable development while working with a wide cross-section of aquaculture interests. These interests include native Hawaiian fishpond restoration, community backyard subsistence aquaculture programs, marine biotechnical microalgae development, and offshore mariculture.
- As much as 75% of the seafood for the State is still imported.
- Fishpond restoration began on Molokai in 1997.

ACTION 1: THE AQUACULTURE PROGRAM SHOULD DEVELOP A BEST MANAGEMENT PRACTICES MANUAL. This manual should identify how wastes will be treated. It should include impacts on other ocean-related activities. For example, discharge may increase phytoplankton, which will decrease water clarity, and negatively impact dive tours (an industry which has grown 100% in the last eight years). Sites where conditions will have minimal impacts should be included.

ACTION 2: FACILITATE AGREEMENTS BETWEEN DOH AND THE AQUACULTURE PROGRAM TO PERMIT AQUACULTURE ACTIVITIES. DOH and the Aquaculture Program should continue to discuss the issues surrounding aquaculture development. The Aquaculture Program can develop their best management practices and construct alternatives for siting aquaculture in areas agreeable to both agencies, and that meet environmental standards and criteria.

Energy

The objective for this sector in the ORMP is to balance optimal, cost-effective development of the State's ocean energy resources, as well as the State's other energy sources, with the preservation of Hawaii's coastal and marine environments (ORMP, p.36). Given this objective, the agency identified to implement actions in this sector was DBEDT's Energy Planning and Policy Branch.

Important changes and continuing needs within this sector have been identified as follows:

- Advances in technology for ocean related areas could increase the economic diversification for the state. Hawaii has skilled technicians and scientists, as well experience in several ocean technologies, which are being requested by other coastal countries in the Pacific and ocean technology development in Hawaii is attracting overseas investment. For example, the consultants with experience in OTEC technology are providing services in China.
- UH and DBEDT held a workshop in 1998 on Ocean Technology to discuss alternatives and new frontiers for exploration in this area, which could be economically beneficial to the State of Hawaii.
- Ongoing programs for Energy Technologies include: the Science Bowl, an energy-related high school contest; Science Project/Fair where prize money is awarded; and, public education efforts by the utilities companies in Hawaii.
- Energy facility siting continues to be controversial. Although energy demand has increased, most projects are subject to NIMBY controversies and some projects, such as the Puna Geothermal development, have been opposed by native Hawaiian communities.
- The Marine Bioresources Engineering Center at UH is being developed with funding assistance from the National Science Foundation for research focusing on identifying and producing products from marine biomass. The legislature has been supportive of the UH and DBEDT cooperative effort which could have a significant impact on the economic opportunities in the state.
- The 1995 Hawaii Energy Strategy includes energy resource inventories and prospective ocean-related energy sources. The plan is a statewide assessment and strategy, which includes a modest database on wave and tidal energy.

ACTION 1: IMPROVE DATABASE LINKAGES WITH OTHER AGENCY DATABASES. The small energy facilities and resources database located at UH should be linked with other state databases. The information should be made accessible to resource managers.

ACTION 2: INCREASE PUBLIC AWARENESS OF MBEC AND ITS CAPABILITIES. As public awareness of marine biotechnology increases, there will be a greater understanding of its uses. The Marine Bioresources Engineering Center at UH could have positive effects by supporting UH research and faculty development, by attracting opportunities for overseas investments, and by providing beneficial uses for local communities.

Marine Minerals

The objective for this sector in the ORMP is to explore the establishment of a marine minerals industry which is economically beneficial, environmentally sound, and socially acceptable to the people of Hawaii (ORMP, p.38). Given this objective, the designated agency identified to implement actions in this sector is DBEDT's Ocean Resources Branch.

Important changes and continuing needs within this sector have been identified as follows:

- Assessment of the viability of mining manganese nodules continues in international waters under the jurisdiction of the United Nations Deep Sea Bed Authority. Research and development continues to investigate alternative uses for tailings from nodules processing, such as bathroom fixtures and agents to control automotive exhaust emissions.
- The State of Hawaii proposed legislation with the US Department of Interior for joint management of marine minerals in Hawaii's Exclusive Economic Zone (200 nautical miles from Hawaii's shoreline). This would enable Hawaii to gain revenue from mining in the EEZ.
- An indirect effect of minerals development will be the increased use of Hawaii's ports by foreign vessels for refueling and transshipment of minerals. Long-term planning needs should be assessed.
- Interest in sand mining has increased as an offshore sand source for beach replenishment.

ACTION 1: RESEARCH IMPACTS OF SAND MINING. Research needs to explore the scientific impacts and benefits of sand mining for beach management, determine if it is a viable option, and then develop supportive infrastructure and opportunities for marine transportation, ocean engineers, and necessary equipment. The UH Coastal Geology Group has expertise in sand resource investigations and suitability for beach and dune restoration.

ACTION 2: RESEARCH ALTERNATIVE USES FOR MARINE MINERALS TAILINGS. Once thought of solely as waste products, minerals tailings from nodules and mineral crusts now appear to have extensive economic value a variety of industrial and agricultural processes. Development of alternative economic uses of these tailings will increase economic benefit and mitigate waste production associated with marine minerals production

Appendix 1.

Interviews Conducted for the 1998 ORMP Update

Department of Business, Economic Development, and Tourism: Energy, Resources, & Technology Division, Ocean Resources Branch, Office of Planning, Coastal Zone Management Program

Department of Education

Department of Land and Natural Resources: Office of the Chairperson, Division of Forestry & Wildlife, Division of Land Management, State Parks Division, Division of Aquatic Resources, Division of Conservation and Resources Enforcement, Division of Boating & Ocean Recreation

Department of Health: Environmental Management Division, Hazard Evaluation and Emergency Response, Office of Wastewater, Office of Clean Water, Office of Solid Waste Management

Department of Transportation: Harbors Division

City & County of Honolulu: Department of Land Utilization, Department of Transportation Services, Department of Parks & Recreation

Hawaii County: Planning Department

Kauai County: Planning Department

Maui County: Planning Department

Western Pacific Regional Fishery Management Council

University of Hawaii at Manoa: School of Ocean, Earth Science, and Technology

US Coast Guard: Marine Safety Division, Law Enforcement and Intelligence Branch

and **Private Interests.**

Appendix 2.

Timeline of the Hawaii Ocean Resources Management Plan

Development of the ORMP

Ocean and Coastal Resource Management Activities

	1988	<ul style="list-style-type: none"> • Test Sites designated for Day Use Mooring Buoys Pin Installation • Military Base Closures & Redevelopment Plans begin
	1989	
Hawaii Ocean Resources Management Act	1990	<ul style="list-style-type: none"> • MHIMRI program begins • HOST and NELHA merge
Hawaii Oceans Management Plan Published	1991	<ul style="list-style-type: none"> • Completion (but not implementation) of the Kaneohe Bay Master Plan • Get the Drift and Bag It begins annual clean-up • Hawaii Integrated Energy Planning completed
COMPAG convened	1992	<ul style="list-style-type: none"> • US Congress issues study for Humpback Whale Sanctuary • Program on Hawaii State Land Use Boundary Review recommends increase in Conservation Lands • MHIMRI plan and inventory completed
	1993	<ul style="list-style-type: none"> • Integrated Solid Waste Planning • NARS program initiated • North Shore Kauai Regional Resource Management Planning conducted • West Maui Watershed Management Project begins • Stream Protection and Management Task Force organized • DRAFT: State Planning & Evaluation for Marina Guidelines completed • Act 340, adding HRS 6K, establishes the Kaho'olawe Island Reserve and the Reserve Commission, the statutory purposes, and the transfer clause to a future sovereign Hawaiian entity.

Development of the ORMP

Legislature Adopts ORMP

Act 104 establishes ORMP
and MACZMAG

Survey Overview and Analysis
of the ORMP by DBEDT

CZMA Sec. 309 Enhancement
Area Grants Program Strategy
recommends ORMP Review

MACZMAG subcommittees
form for: ORMP
Implementation and Erosion

ORMP Review

Ocean and Coastal Resource Management Activities

- 1994**
- American Flag Pacific Island Coral Reef Initiative developed
 - Governor's Committee on Ending Litter established
 - Na Ala Hele completes trail inventory
 - A limited entry program resolved the Longliner Fishing controversy
 - Legislature Adopts regulations from the Coastal Hazard Mitigation Planning Project, Phase 1
- 1995**
- Hawaii Supreme Court determines PASH decision
 - Permits granted for Day Use Mooring Buoys
 - Riparian Nonpoint Pollution Control plan developed
 - OEQC publishes Draft Shoreline Hardening Policy and Environmental Assessment Guidelines
- 1996**
- Ala Wai Canal Watershed Planning initiated
 - Aquaculture: First Year of Revenue Profit for Spirulina development and sales at NELH
 - Coastal Hazard Mitigation, Phase 2 completed
 - Nonpoint Pollution Management Draft Plan submitted
 - Interim Guidance for Beach Erosion Management developed
- 1997**
- PASH Study Group formed
 - Governor's Committee for a Beautiful Hawaii renames the committee and prioritizes projects
 - Governor approves EIS & Management Plan for the National Hawaiian Humpback Whale Sanctuary
 - Nonpoint Pollution Management Plan adopted, begin coordinating implementation
 - Fishpond Restoration in Molokai permitted
 - Hot Spot Management Areas identified by DLNR for the State
 - EPA Grants provided for community Watershed Planning efforts
 - Coastal Erosion Management Plan (COEMAP) adopted by BLNR
 - US Army Corps developing permit for beach nourishment
 - DOT erosion study for shoreline hardening on highways
 - The Kahoolawe Island Reserve Ocean Resources Management Plan (KOMP) completed and adopted
- 1998**
- Natural Fish Habitat Designations, NMFS & WESTPAC
 - Hawaii Maritime Authority planning begins
 - Erosion Management Conference, April 1998
 - Erosion Management District planning initiated by DLNR with CZM
 - Beach Restoration Project - DLNR and Military
 - DOT Master Plan 2020 completed